



**POTESTA & ASSOCIATES, INC.**

**Engineers and Environmental Consultants**

December 2003

**CA-750 GROUNDWATER  
ENVIRONMENTAL INDICATORS  
DATA EVALUATION REPORT**

*Flexsys America L.P. Facility  
Nitro, West Virginia*

*Prepared for:*

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Project No. 01-0081-320A

## TABLE OF CONTENTS

1.0	INTRODUCTION .....	1
2.0	SCOPE OF WORK.....	1
3.0	DATA VALIDATION SUMMARY .....	3

### **APPENDICES**

Figure 1 - Site Location Map and Figure 2 - Proposed Sample Locations.....	APPENDIX A
Results of Analytical Data Quality Evaluation – CA-750 Groundwater Characterization Investigation .....	APPENDIX B
Results of Analytical Data Quality Evaluation – Kanawha River Surface Water Samples .....	APPENDIX C
Results of Analytical Data Quality Evaluation – Kanawha River Sediment Samples .....	APPENDIX D
Table 1 – Summary of Invalid Data for GW-4C, GW-6C and GW-11C .....	APPENDIX E

# CA-750 GROUNDWATER ENVIRONMENTAL INDICATORS DATA EVALUATION REPORT

*Flexsys America L.P. Facility  
Nitro, West Virginia*

## 1.0 INTRODUCTION

This data evaluation report serves to summarize the findings of a data quality evaluation conducted on the analytical data resulting from the recently completed site investigation at the Flexsys America L.P. facility (Figure 1 – Site Location Map in Appendix A) located in Nitro, West Virginia. This investigation was completed to allow for the evaluation of the CA-750 Environmental Indicators, *“Migration of Contaminated Groundwater Under Control Environmental Indicator Report.”* During the development and approval of the work plan for the work, USEPA required that all the analytical work be performed with 100 percent data validation. The validation procedures were to be completed at the M3 level. Completed validation efforts at this level were required to provide a measure of overall usability of the analytical data during future decisions regarding the corrective measures to be implemented at the site.

The information presented and evaluated in this report relates specifically to the analytical results of the laboratory tests which were conducted for the CA-750 Groundwater Environmental Indicator Report. This data includes analytical results from the tests conducted on the groundwater, sediment and surface water samples (Figure 2 – Proposed Sample Locations in Appendix A) collected at the Flexsys site. This report summarizes the evaluation of the data quality and discusses the recommended data qualifiers.

Specific details related to the required quality assurance/quality control methods employed during completion of this work are summarized in the previously submitted and approved Quality Assurance Protection Plan. This document was submitted as supplemental information along with the project work plan document entitled *“Site Assessment Work Plan – Final; CA-750 Groundwater Characterization Investigation; Process and Wastewater Treatment Plant Areas, Flexsys America, L.P. Facility, Nitro WV”* dated May 2003.

## 2.0 SCOPE OF WORK

During the development of the work plan, the following analytical procedures were completed as referenced in the approved work plan document:

- ◆ Target Compound List (TCL) Volatile Organic Compounds (VOC)  
*[EPA Method 8260B]*

- ◆ TCL Semivolatile Organic Compounds (SVOC)  
[EPA Method 8270C]
- ◆ TCL Chlorinated Dibenzo-p-dioxin/Dibenzofuran Congeners  
[EPA Method 1613B]
- ◆ TAL Metals plus Cyanide  
[EPA Method 6010, 9012]
- ◆ Chlorinated Herbicides  
[EPA Method 8151A]

Severn Trent Laboratories (STL) of Savannah, Georgia completed all analytical testing with the exception of the dioxin analyses, which were performed in STL's Sacramento, California laboratory facility. Analytical testing associated with the initial 2001 Kanawha River sampling event was completed by REI Consultants, Inc. of Beaver, West Virginia.

Each of the data deliverables was received from the laboratory in both hard copy and electronic format. The data was managed using an integrated database management program known as EQUIS. This program receives the analytical database information directly from the laboratory in a formatted electronic data deliverable file. These files were transferred from the laboratory via email. The database is integrated with several other programs such as GIS, graphing and statistical analysis/modeling software allowing for ease of presentation and evaluation of the data.

All of the validation procedures utilized with respect to the VOC, SVOC and Chlorinated Herbicide analyses followed the requirements of the USEPA guidance "*USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*," dated October 1999. The validation of inorganic data followed the requirements included in the USEPA guidance "*USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*," dated October 1999.

The evaluation and validation of the dioxin/furan analytical results was conducted in compliance with the guidelines and requirements of the "*USEPA Contract Laboratory Program National Functional Guidelines for Chlorinated Dioxin/Furan Data Review*," EPA-540-R-02-003 dated August 2002.

The specific data quality findings and recommended final data qualifications are presented in the appendices of this document. The data is organized in the following manner.

- ◆ Groundwater (Appendix B)
  - Organic Data
  - Inorganic Data
- ◆ Kanawha River Surface Water (Appendix C)
  - Organic Data
- ◆ Kanawha River Sediment (Appendix D)
  - Organic Data

Each appendix includes a summary narrative relating the specific findings and data quality recommendations associated with that data set. Corresponding data qualifiers, which are based on the USEPA Contract Laboratory Procedures, are also noted where appropriate. Additionally, tables summarizing the data validation as well as the recommended data qualifiers are attached for each media type.

### 3.0 DATA VALIDATION SUMMARY

The overall quality of data for this study exceeds the laboratory goal of 90 percent valid results. Furthermore, the quality of the data corresponding to this study is very good. The following table provides a summary of the data validity rates:

Data Validity Rates	
Data Set	Validity Rate
Groundwater	98.6%
Surface Water	100%
Sediment	99.5%

The data validity rate was calculated for each data set associated with this study according to the following formula:

$$\text{Data Validity Rate} = [(N - R) / N] \times 100$$

Where: N = total number of data  
R = number of data determined to be invalid

During the completion of the data validation review process, a number of invalid ("R" qualified) data was noted. The assignment of an "R" qualifier to certain results was due to a number of analytical anomalies and deviation from either laboratory or USEPA standards. The following data validation narratives provide justification for the assignment of the additional qualifiers.

#### Invalid Groundwater Data

VOCs	GW-11 A, B and C	Bromomethane
	GW-22 A and B	Dichlorodifluoromethane
	GW-23 A, B and C	Dichlorodifluoromethane
	GW-24 A, B and C	Bromomethane
	GW-25 A, B and C	Dichlorodifluoromethane
		Trichlorofluoromethane
	GW-26 B	1,2,4-Trichlorobenzene
	GW-27 A, B and C	Bromomethane
	GW-28 B	Dichlorodifluoromethane

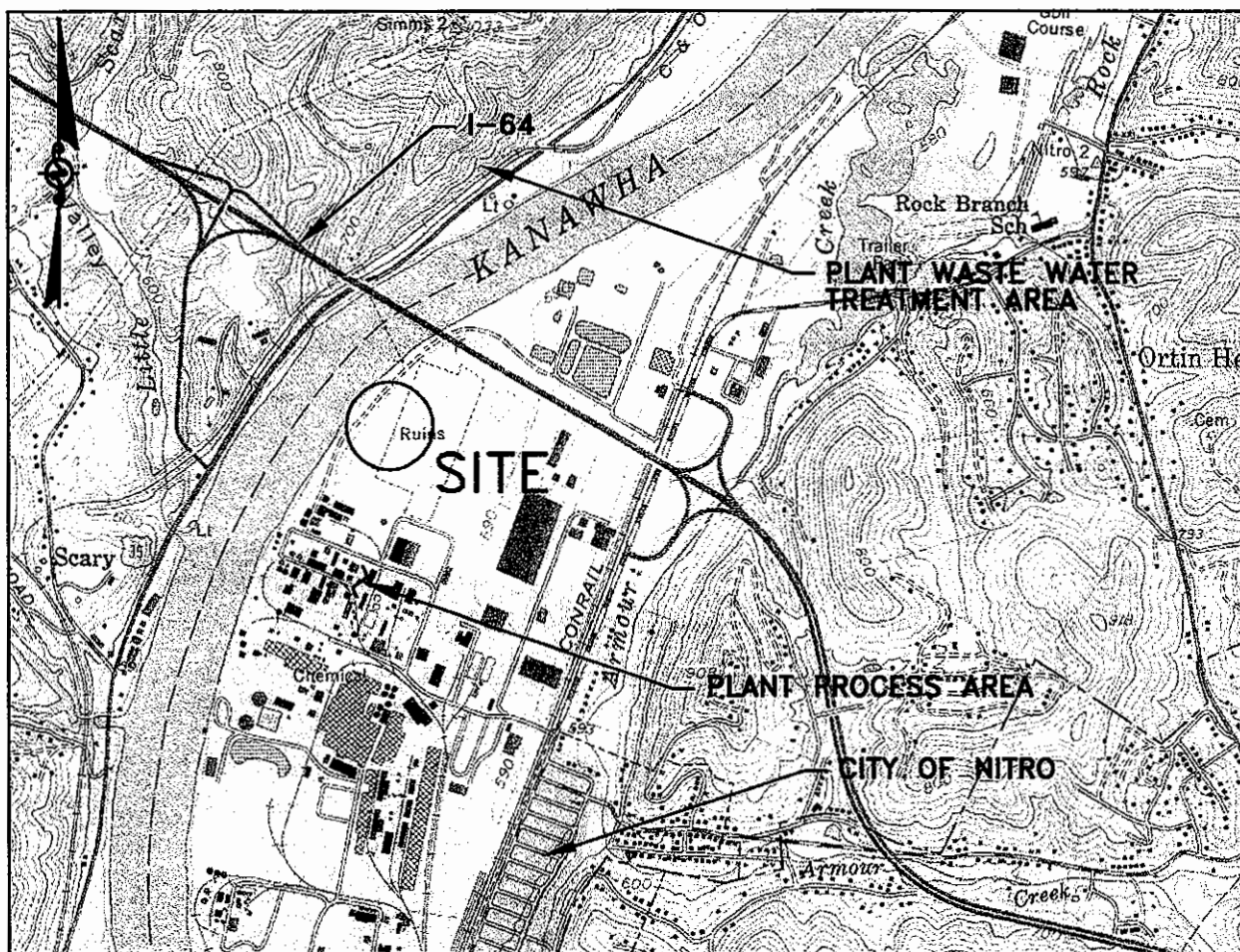
<b>SVOCs</b>	GW-4 C	See Table 1
	GW-6 C	See Table 1
	GW-8 A and B	Aniline
	GW-9 A	Aniline
	GW-11 C	See Table 1
	GW-12 A, B and C	Aniline
	GW-13 A, B and C	Aniline
	GW-15, A, B and C	Aniline
	GW-16 A	Aniline
	GW-22 B	Aniline
	GW-23 A, B and C	Aniline
	GW-24 A, B and C	Aniline
	GW-27 A, B and C	Aniline
	GW-28 A, B and C	Aniline
	GW-31 B	Aniline
	GW-33 B	Aniline

#### **Invalid Sediment Data**

<b>Dioxins/Furans</b>	ASD-7	1,2,3,4,6,7,8-HpCDF
	ASD-10	1,2,3,7,8-PeCDF
		1,2,3,4,6,7,8-HpCDF
	CSD-2	1,2,3,4,6,7,8-HpCDF
	CSD-9	1,2,3,4,6,7,8-HpCDF
	DSD-1	1,2,3,7,8-PeCDF
		1,2,3,4,6,7,8-HpCDF
	DSD-2	1,2,3,4,6,7,8-HpCDF
	DSD-3	1,2,3,4,6,7,8-HpCDF
	ESD-2	1,2,3,4,6,7,8-HpCDF
	ESD-3	1,2,3,4,6,7,8-HpCDF
	FSD-3	1,2,3,4,6,7,8-HpCDF
	FSD-4	1,2,3,4,6,7,8-HpCDF
	GSD-1	1,2,3,4,6,7,8-HpCDF
	GSD-4	1,2,3,4,6,7,8-HpCDF
	GSD-6	1,2,3,4,6,7,8-HpCDF

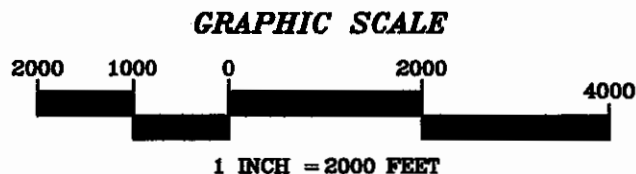
It is recommended that none of the invalid data be replaced. All of the invalid data consisted of non-detect results. In addition, there are no action limits pertaining to aniline or any of the furans, and the invalid data involving halomethanes and 1,2,4-Trichlorobenzene represent a very small portion of the completed data set. Therefore, the conclusions presented in the associated CA-750 Environmental Indicator Report would not be substantively affected if the data were replaced. SVOC analytical data associated with samples GW-4C, GW-6C, and GW-11C (Table 1 in Appendix E) are 90 percent invalid. However, these sampling points represent only 3 percent of the total number of sampling points. Therefore, once again, the overall conclusions of the site study are not compromised.

# ***APPENDIX A***



**SITE LOCATION MAP**

QUADRANGLE: SAINT ALBANS, WV  
USGS 7.5' SERIES  
TOPOGRAPHIC MAP  
PHOTOREVISED: YEAR 1976



# **Potesta & Associates, Inc.** ENGINEERS AND ENVIRONMENTAL CONSULTANTS

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Project

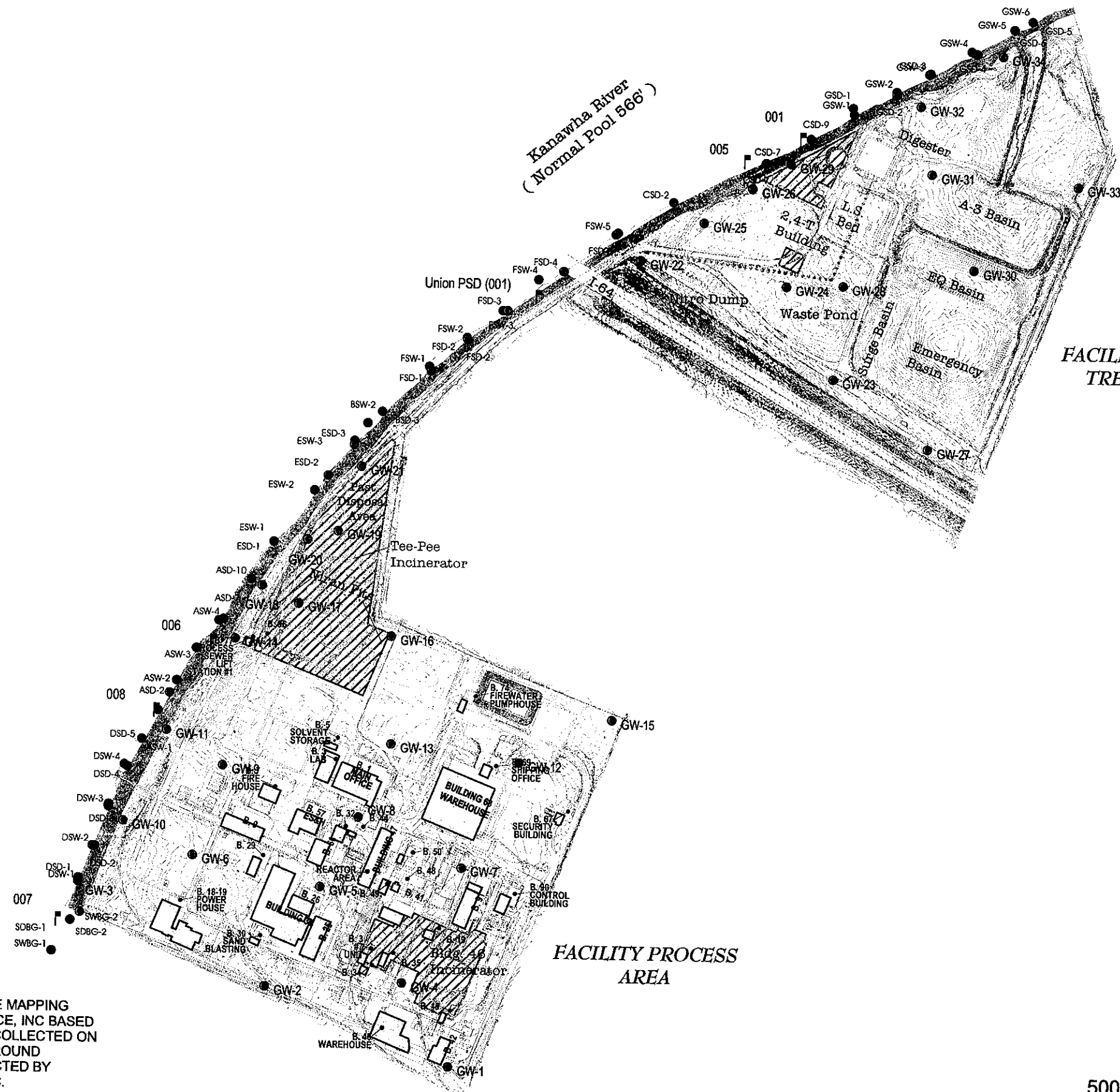
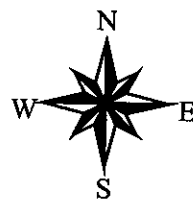
CA-750 EI INVESTIGATION  
FLEXSYS AMERICA LP. PLANT  
NITRO, WEST VIRGINIA

Scale 1"=2000'

Dwg. No.








Date DECEMBER 2003

FIGURE 1



MAPPING REFERENCE: BASE MAPPING  
PREPARED BY PHOTOSCIENCE, INC BASED  
ON AERIAL PHOTOGRAPHS COLLECTED ON  
SEPTEMBER 24, 2003 AND GROUND  
CONTROL SURVEYS CONDUCTED BY  
POTESTA & ASSOCIATES, INC.

#### LEGEND

-  NPDES outfall locations
-  Groundwater Locations
-  Sediment Locations
-  Surface Water Locations
-  "No Dig" Areas
-  SWMUs
-  Flexsys Buildings

500 0 500 1000 Feet

CA-750 EI Project.apr  
ArcView File No.

JMS  
Drawn

CAG  
Checked

CAG  
Approved

1" = 500'  
Scale

12/10/2003  
Date

01-0081-320A  
Project No.

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SOLUTIA, INC.  
FLEXSYS AMERICA L.P.  
NITRO, WEST VIRGINIA FACILITY

CA-750 INVESTIGATION  
DATA VALIDATION REPORT  
SITE PLAN

2

Drawing No.

## ***APPENDIX B***

## RESULTS OF ANALYTICAL DATA QUALITY EVALUATION

### *CA-750 Groundwater Characterization Investigation*

This evaluation was conducted by Potesta & Associates, Inc. (POTESTA) on analytical data associated with groundwater samples collected during the period of June 6 through July 2, 2003 from both the process area and the wastewater treatment unit area of the Flexsys America, L.P. chemical production facility in Nitro, West Virginia. The parameters associated with this data set are described in the project site assessment work plan titled "*CA-750 Groundwater Characterization Investigation*" proposed by Solutia Inc. and submitted to the USEPA-Region III and the West Virginia Department of Environmental Protection, Office of Land Restoration.

Severn Trent Laboratories of Savannah, Georgia analyzed samples for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, cyanide, and herbicides. Severn Trent Laboratories of Sacramento, California analyzed samples for polychlorinated dibenzo-p-dioxins (dioxins) and polychlorinated dibenzofurans (furans).

Laboratory data summaries were prepared and received in EPA Level IV QA/QC format. This QA/QC deliverable requirement, along with a 100 percent data validation request, has been completed for this project at the direction of USEPA – Region III. The following narratives serve to provide a summary of the data quality review of the collected groundwater samples from both the process area and the wastewater treatment unit area.

POTESTA collected 110 groundwater samples which were submitted to the laboratories for the analyses prescribed by the work plan. The samples were divided into sample delivery groups (SDG) and sub-divided into projects by STL-Savannah, and divided into projects by STL-Sacramento.

**Table 1**

<b>Savannah SDG</b>	<b>Savannah Project No.</b>	<b>Sacramento Project No.</b>	<b>Sample Names</b>
NV004	S384319	G3F100238	GW-25A, GW-25B, GW-25C, GW-26C
SNW001	S384411	G3F120315	GW-26A, GW-26B, GW-29A, GW-29B, GW-29C
SNW002	S384524	G3F140168	GW-32A, GW-32A FF <sup>1</sup> , GW-32B, GW-32B FF <sup>1&amp;2</sup> , GW-32C, GW-31A, GW-31C, GW-30A, GW-30B, GW-30C, GW-33A, GW-33C
SNW003	S384572	G3F170175	GW-31B, GW-33C, GW-28C, GW-28A
SNW004	S384666	G3F190280	GW-24A, GW-24B, GW-24C, GW-27A, GW-27B, GW-27C
SNW005	S384699	G3F200227	GW-22A, GW-22B, GW-22C, GW-23A, GW-23B, GW-23C, GW-28B

Savannah SDG	Savannah Project No.	Sacramento Project No.	Sample Names
	S384773	G3F230147	GW-3A, GW-3B, GW-3C, GW-34A, GW-34B, GW-34C, GW-10A, GW-10A FF <sup>1</sup> , GW-10B, GW-10C
SNW006	S384863	G3F250215	GW-11A, GW-11B, GW-11C, GW-11CC
	S384909	G3F270226	GW-6A, GW-6B, GW-6C, GW-14A, GW-14B, GW-14C
SNW007	S384958	G3F270278	GW-9B, GW-9C, GW-16B, GW-16C
	S385103	G3G020257	GW-2A, GW-2B, GW-2C, GW-5A, GW-5B, GW-5C
SNW07A	S384995	G3F280209	GW-9A, GW-13A, GW-13B, GW-13C, GW-15A, GW-15B, GW-15C, GW-16A
	S385049	G3G010197	GW-8A, GW-8B, GW-8C, GW-12A, GW-12B, GW-12C
SNW008	S385158	G3G030229	GW-1A, GW-1B, GW-1C, GW-4A, GW-4A FF <sup>1</sup> , GW-4B, GW-4C, GW-7A, GW-7B, GW-7C
SNW009	S385386	G3G120155	GW-17A, GW-19A, GW-19AA
	S385421	G3G160213	GW-20A, GW-21A, GW-21A FF <sup>1</sup> , GW-18A
SNW010	S385817	G3G260180	GW-19B, GW-19C, GW-20B, GW-20C, GW-21B, GW-21C
	S385854	G3G290199	GW-17B, GW-18B, GW-18C, GW-17C, GW-EDB <sup>3</sup>
NA	NA	G3I080131	GW-20B, GW-17B, GW-17C (Reanalyses)
NA	NA	G3J030185	GW-27C, GW-30A, GW-25C, GW-25A, GW-20A, GW-21B, GW-20B, GW-19C, GW-17A, GW-17C, GW-17B (Resamples)

<sup>1</sup> For analysis by STL-Sacramento only.

<sup>2</sup> Analysis cancelled.

<sup>3</sup> Equipment decontamination blank for STL-Savannah only.

The following table relates sample names to corresponding laboratory sample identifications.

**Table 2**

Sample Name	Savannah Sample ID	Sacramento Sample ID	Sample Name	Savannah Sample ID	Sacramento Sample ID
GW-25A	84319-1	G3F100238-1	GW-16C	84958-4	G3F270278-4
GW-25B	84319-2	G3F100238-2	GW-9A	84995-1	G3F280209-1
GW-25C	84319-3	G3F100238-3	GW-13A	84995-2	G3F280209-2
GW-26C	84319-4	G3F100238-4	GW-13B	84995-3	G3F280209-3
GW-26A	84411-1	G3F120315-1	GW-13C	84995-4	G3F280209-4
GW-26B	84411-2	G3F120315-2	GW-15A	84995-5	G3F280209-5
GW-29A	84411-4	G3F120315-4	GW-15B	84995-6	G3F280209-6
GW-29B	84411-5	G3F120315-5	GW-15C	84995-7	G3F280209-7
GW-29C	84411-3	G3F120315-3	GW-16A	84995-8	G3F280209-8
GW-32A	84524-2	G3F140168-3	GW-8A	85049-1	G3G010197-1
GW-32A FF	NA	G3F140168-5	GW-8B	85049-2	G3G010197-2
GW-32B	84524-1	G3F140168-1	GW-8C	85049-3	G3G010197-3
GW-32B FF	NA	cancelled	GW-12A	85049-4	G3G010197-4
GW-32C	84524-3	G3F140168-4	GW-12B	85049-5	G3G010197-5

Sample Name	Savannah Sample ID	Sacramento Sample ID	Sample Name	Savannah Sample ID	Sacramento Sample ID
GW-31A	84524-5	G3F140168-7	GW-12C	85049-6	G3G010197-6
GW-31C	84524-4	G3F140168-6	GW-2A	85103-1	G3G020257-1
GW-30A	84524-7	G3F140168-9	GW-2B	85103-2	G3G020257-2
GW-30B	84524-9	G3F140168-11	GW-2C	85103-3	G3G020257-3
GW-30C	84524-6	G3F140168-8	GW-5A	85103-4	G3G020257-4
GW-33A	84524-8	G3F140168-10	GW-5B	85103-5	G3G020257-5
GW-33C	84524-10	G3F140168-12	GW-5C	85103-6	G3G020257-6
GW-31B	84572-1	G3F170175-1	GW-1A	85158-1	G3G030229-1
GW-33B	84572-2	G3F170175-2	GW-1B	85158-2	G3G030229-2
GW-28C	84572-3	G3F170175-3	GW-1C	85158-3	G3G030229-3
GW-28A	84572-4	G3F170175-4	GW-4A	85158-4	G3G030229-4
GW-24A	84666-2	G3F190280-2	GW-4A FF	NA	G3G030229-10
GW-24B	84666-3	G3F190280-3	GW-4B	85158-5	G3G030229-5
GW-24C	84666-1	G3F190280-1	GW-4C	85158-6	G3G030229-6
GW-27A	84666-4	G3F190280-4	GW-7A	85158-7	G3G030229-7
GW-27B	84666-6	G3F190280-6	GW-7B	85158-8	G3G030229-8
GW-27C	84666-5	G3F190280-5	GW-7C	85158-9	G3G030229-9
GW-22A	84699-1	G3F200227-1	GW-17A	85386-1	G3G120155-1
GW-22B	84699-2	G3F200227-2	GW-19A	85386-2	G3G120155-2
GW-22C	84699-3	G3F200227-3	GW-19AA	85386-3	G3G120155-3
GW-23A	84699-4	G3F200227-4	GW-20A	85421-1	G3G160213-1
GW-23B	84699-5	G3F200227-5	GW-21A	85421-2	G3G160213-2
GW-23C	84699-6	G3F200227-6	GW-21A FF	NA	G3G160213-3
GW-28B	84699-7	G3F200227-7	GW-18A	85421-3	G3G160213-4
GW-3A	84773-1	G3F230147-1	GW-19B	85817-1	G3G260180-1
GW-3B	84773-2	G3F230147-2	GW-19C	85817-2	G3G260180-2
GW-3C	84773-3	G3F230147-3	GW-20B	85817-3	G3G260180-3
GW-34A	84773-4	G3F230147-4	GW-20C	85817-4	G3G260180-4
GW-34B	84773-5	G3F230147-5	GW-21B	85817-5	G3G260180-5
GW-34C	84773-6	G3F230147-6	GW-21C	85817-6	G3G260180-6
GW-10A	84773-7	G3F230147-7	GW-17B	85854-1	G3G290199-1
GW-10A FF	NA	G3F230147-8	GW-18B	85854-2	G3G290199-2
GW-10B	84773-8	G3F230147-9	GW-18C	85854-3	G3G290199-3
GW-10C	84773-9	G3F230147-10	GW-17C	85854-4	G3G290199-4
GW-11A	84863-1	G3F250215-1	GW-EDB	85854-5	NA
GW-11B	84863-2	G3F250215-2	GW-27CResamp	NA	G3J030185-1
GW-11C	84863-3	G3F250215-3	GW-30AResamp	NA	G3J030185-2
GW-11CC	84863-4	G3F250215-4	GW-25CResamp	NA	G3J030185-3
GW-6A	84909-1	G3F270226-1	GW-25AResamp	NA	G3J030185-4
GW-6B	84909-2	G3F270226-2	GW-20AResamp	NA	G3J030185-5
GW-6C	84909-3	G3F270226-3	GW-21BResamp	NA	G3J030185-6
GW-14A	84909-4	G3F270226-4	GW-20BResamp	NA	G3J030185-7
GW-14B	84909-5	G3F270226-5	GW-19CResamp	NA	G3J030185-8
GW-14C	84909-6	G3F270226-6	GW-17AResamp	NA	G3J030185-9
GW-9B	84958-1	G3F270278-1	GW-17CResamp	NA	G3J030185-10
GW-9C	84958-2	G3F270278-2	GW-17BResamp	NA	G3J030185-11
GW-16B	84958-3	G3F270278-3			

The following narratives provide brief summaries of Contract Laboratory Program (CLP) technical requirements, and indicate issues which are outside technical requirements resulting in data qualification. Issues having no impact upon data quality were not addressed.

## **VOLATILE ORGANIC COMPOUNDS**

POTESTA, following the USEPA guidance "*USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*" dated October 1999, completed data validation procedures for the volatile organic compound analyses.

Samples listed by STL-Savannah laboratory identification numbers in Table 2, along with trip blanks which accompanied each sample shipment, were analyzed for VOCs by SW-846 Method 8260B.

### **Holding Times**

Technical holding time requirements state that samples must be acid preserved (pH 2 or less), maintained at 4°C ( $\pm 2^\circ\text{C}$ ), and analyzed within 14 days of sample collection.

### **GC/MS Instrument Performance Checks**

The laboratory performed required instrument performance checks with bromofluorobenzene at the beginning of each 12-hour analytical period on each instrument utilized for sample analysis. Each performance check met the required ion abundance criteria indicating the instruments were in tune and operating properly.

### **Initial Calibration**

Initial calibration data were reviewed with regard to relative response factors (RRFs), percent relative standard deviation, calibration curve linearity, and standard concentrations.

### **Continuing Calibration**

Continuing calibration (CC) evaluations were based on the following criteria: (1) continuing calibration analysis must be performed at the beginning of each 12-hour analytical period following the analysis of the instrument performance check and prior to the analysis of the method blank; (2) RRFs for each target compound and surrogate must be greater than or equal to 0.05; and (3) % Difference (%D) or % Drift, depending on the type of calibration curve as discussed in SW-846 Method 8000, must be within  $\pm 30\%$  of the initial calibration RRF or initial calibration amount.

**NV004** Chloromethane, chloroethane, methylene chloride, trans-1,2-dichloroethene, and MTBE in the CC (data files bq201/203) for batch 1B0613 were outside QC limits. Positive results for chloromethane (8.1 ppb) in 84319-3 and MTBE (0.39 ppb) in

84319-1 were qualified "J". The remaining data for these compounds in Samples 84319-1, 84319-2, and 84319-3 were non-detect and qualified "UJ".

The compounds methyl acetate, cyclohexane, and methyl cyclohexane were not included in the CC for batch 1B0613. These compounds were not detected in any of the samples (84319-1, -2, and -3) analyzed under this analytical batch; non-detect data for these compounds were qualified "UJ".

Methyl acetate and chloroethane in the CC (data files bq246/247/251) for batch 1B0619 were outside QC limits. Non-detect data for these compounds in Sample 84319-4 were qualified "UJ".

SNW003 The %D for 1,1,2-trichloro-1,2,2-trifluoroethane in the continuing calibration (data file bq342) exceeded QC limits. 1,1,2-trichloro-1,2,2-trifluoroethane data for this SDG, all of which was non-detect, was qualified "UJ".

SNW004 The % drift and RRF for bromomethane were outside QC limits requiring "R" qualification of non-detect bromomethane data for all samples.

The % drift for chloroethane was outside QC limits requiring "UJ" qualification of non-detect chloroethane data for all samples.

SNW005 Exceedance of %D / % Drift criteria resulted in "UJ" qualification of non-detect data for the compounds: chloroethane, cis-1,2-dichloroethene, 2-butanone, and 1,2-dichloroethane in 84699-3.

Non-detect data for chloroethane in Samples 84699-1, 84699-4, 84699-5, 84699-6, and 84699-7 were qualified "UJ" due to % Drift exceedance.

Positive datum for chloroethane in 84699-2 (5.1 ppb) was "J" qualified due to % Drift exceedance.

Non-detect data for bromomethane in Samples 84773-1 through 84773-9 were "UJ" qualified due to % Drift exceedance.

SNW006 A low RRF value resulted in "R" qualification for non-detect bromomethane data in Samples 84863-1 through 84863-4.

Exceedance of %D / % Drift criteria resulted in "UJ" qualification of non-detect data for the compounds: dichlorodifluoromethane, chloroethane, and trichlorotrifluoroethane in Samples 84863-1 through 84863-4.

Exceedance of %D criteria resulted in "J" qualification for positive results for 2-butanone in Samples 84863-1 through 84863-4.

SNW007 Non-detect data for dichlorodifluoromethane in Samples 85103-1 through 85103-5 were qualified "UJ" due to %D exceedance.

SNW07A All bromomethane data, all of which were non-detect, for this SDG were qualified "UJ" because % drift for bromomethane was outside QC limits for each associated continuing calibration.

SNW008 Non-detect data for dichlorodifluoromethane in Samples 85158-1 through 85158-5, and 85158-7 were qualified "UJ" due to %D exceedance.

Non-detect data for trichlorotrifluoroethane and bromomethane in Samples 85158-6, 85158-8, and 85158-9 were qualified "UJ" due to %D / % drift exceedance.

SNW009 Non-detect data for trichlorotrifluoroethane and bromomethane in Samples 85386-1, 85386-2 and 85386-3, and 85421-1, 85421-2 and 85421-3 were qualified "UJ" due to %D / % drift exceedance.

SNW010 Samples 85817-1, 85817-2, 85817-4, 85817-5, 85817-6, 85854-3, 85854-4, 85854-5 are qualified as follows: positive results for acetone – "J"; non-detect results for bromoform, bromomethane and trichlorotrifluoroethane – "UJ".

Non-detect results for bromomethane, 1,2-dichloroethane and trichlorotrifluoroethane in Sample 85817-3 were qualified "UJ" due to %D / % drift exceedance.

Non-detect results for bromomethane and trichlorotrifluoroethane in Samples 85854-1 and 85854-2 were qualified "UJ" due to %D / % drift exceedance.

## **Blanks**

The laboratory analyzed method blanks and trip blanks as part of the analytical QA/QC for this project work plan. Method blanks are used to identify laboratory, background, and reagent contamination; trip blanks accompany samples from the time of collection to their arrival at the lab and determine if the samples were contaminated during shipment.

Blanks should contain no contamination. If a blank is found to be contaminated with one or more target analytes, then data qualification of the associated samples are determined based on the magnitude of the blank contamination as compared to the concentrations of the particular analytes in the samples. As a rule (5X rule), if the concentration of a particular analyte in a sample is less than 5 times the concentration of that same analyte in an associated blank, then the positive result for that analyte would be qualified as not detected (U). For the common VOC laboratory contaminants (methylene chloride, acetone, 2-butanone, and cyclohexane), positive results would be qualified as not detected if the sample concentration was less than 10 times the concentration found in the blank (10X rule).

The following positive results were qualified "U" due to blank contamination.

NV004 Toluene in 84319-2, 84319-3, and 84319-4; 1,2,4-trichlorobenzene in 84319-3; styrene in 84319-1 through 84319-4; isopropyl benzene in 84319-1; ethyl benzene in

84319-2, 84319-3, and 84319-4; benzene in 84319-3; xylenes in 84319-2 and 84319-4; 1,3-dichlorobenzene in 84319-4.

SNW001 Trichloroethene in 84411-1 through 84411-4; toluene in 84411-1 through 84411-5; acetone in 84411-2 through 84411-5; styrene in 84411-1, 84411-3 through 84411-5; 4-methyl-2-pentanone 84411-4.

SNW002 Acetone, 2-butanone, benzene, toluene, ethyl benzene, styrene, and xylenes in 84524-1; acetone, trichloroethene, toluene, and styrene in 84524-2; acetone, 2-butanone, benzene, toluene, and styrene in 84524-3; toluene and styrene in 84524-4; acetone, 2-butanone, toluene, styrene, and xylenes in 84524-5; acetone, toluene, trichloroethene, ethyl benzene, styrene, and xylenes in 84524-6; acetone, 2-butanone, and styrene in 84524-7; 2-butanone, toluene, ethyl benzene, and styrene in 84524-8; 2-butanone, benzene, toluene, ethyl benzene, styrene, and xylenes in 84524-9; 2-butanone, toluene, and styrene in 84524-10.

SNW004 Acetone in Samples 84666-1, 84666-2, 84666-4, and 84666-6; ethyl benzene in 84666-2 and 84666-4; styrene in Samples 84666-1, 84666-4, 84666-5, and 84666-6.

SNW005 Styrene in 84699-4; carbon tetrachloride in Samples 84773-3 and 847738.

SNW006 Acetone in Samples 84909-2, 84909-4, 84909-5, and 84909-6; benzene in 84909-2 and 84909-4; 2-butanone in 84909-6; ethyl benzene in 84909-3, 84909-4, 84909-5, and 84909-6; MTBE in 84909-2, 84909-3, and 84909-4; styrene in 84863-1, 84909-2, 84909-3, and 84909-4 and in 84909-2, 84909-3, 84909-4, 84909-5, and 84909-6; toluene in 84909-3 and 84909-6; trichloroethene in 84909-6; total xylenes in 84909-3, 84909-4, and 84909-6.

SNW007 Acetone in 85103-1, 85103-2, 85103-3, and 85103-5 and in 84958-2 and 84958-4; benzene in 85103-2 and 85103-3; 2-butanone in 85103-3 and 85103-6; chlorobenzene in 85103-6; cis-1,2-dichloroethene in 84958-4; ethyl benzene in 85103-2, 85103-3, and 85103-5 and in 84958-2; MIBK in 85103-1; styrene in 85103-1, 85103-2, 85103-3, and 85103-5; total xylenes in 85103-2, 85103-3, 85103-5, and 85103-6.

SNW07A Total xylenes in 84995-5, 84995-6, and 84995-7 and in 85049-4 and 85049-5; acetone in 84995-2, 84995-5, 84995-6, and 84995-7 and in 85049-6; benzene in 84995-2, 84995-5, 84995-6, 84995-7, and 84995-8 and in 85049-4, 85049-5, and 85049-6; ethyl benzene in 85049-1 and 85049-4; styrene in 84995-5, 84995-6, and 84995-7 and in 85049-1, 85049-4, 85049-5, and 85049-6.

SNW008 Cis-1,2-dichloroethene in 85158-2 and 85158-3; trichloroethene in 85158-2, 85158-3, and 85158-7; vinyl chloride in 85158-7 and 85158-9; tetrachloroethene in 85158-3 and 85158-7.

SNW010 Acetone in 85817-1, 85817-2, 85817-4, 85817-5 and 85817-6; ethyl benzene in 85854-3 and 85854-5; styrene in 85817-4 and 85854-2, 85854-3, 85854-4, 85854-5; total xylenes in 85854-5.

### **System Monitoring Compounds**

Three system monitoring compounds (dibromofluoromethane, toluene-d8, and p-bromofluorobenzene) are required to be added to all samples and blanks, and recoveries must be within limits specified in the method.

### **Matrix Spikes/Matrix Spike Duplicates**

Matrix spike/matrix spike duplicate data were evaluated on the basis of the CLP criteria for frequency (1 MS/MSD pair per 20 samples), spike recovery, and relative percent difference between spike and spike duplicate recoveries. MS/MSD criteria were not used solely as a basis for sample data qualification, but were used in conjunction with other criteria in determining data qualification.

NV004 The percent recoveries for benzene, chlorobenzene, and chloroethane in the MS/MSD (GW-25C) were outside QC limits.

SNW001 The percent recoveries for chloroethane, 1,1,1-trichloroethane, 4-methyl-2-pentanone, 2-hexanone (all high-bias), and 1,2,4-trichlorobenzene (low bias) in the MS/MSD (GW-26B) were outside QC limits. Examination of the LCS indicated no recovery problems associated with these compounds; this was determined to be a sample specific matrix interference issue. The non-detect datum for 1,2,4-trichlorobenzene in Sample 84411-2 was qualified "R".

SNW006 Recoveries for bromomethane and trichloroethene were outside QC limits (high biased) in the MS and MSD (84909-1); based on this information alone, the positive result for trichloroethene in 84909-1 (4600 ppb) was qualified "J".

### **Laboratory Control Samples**

Laboratory control sample (LCS) data are an indication of analytical accuracy and laboratory performance. A LCS must be analyzed at a frequency of 1 per 20 samples and contain the following compounds within QC limits: vinyl chloride, 1,2-dichloroethane, carbon tetrachloride, 1,2-dichloropropane, trichloroethene, 1,1,2-trichloroethane, benzene, cis-1,3-dichloropropene, bromoform, tetrachloroethene, 1,2-dibromomethane, and 1,4-dichlorobenzene.

NV004 The positive result for chloromethane (8.1 ppb) in 84319-3 was qualified "J" due to a high recovery of chloromethane in the associated LCS.

Non-detect results for dichlorodifluoromethane, methylene chloride, and trichlorofluoromethane in 84319-1, 84319-2, and 84319-3 were qualified "R" due to low LCS recoveries.

**SNW005** The recovery of dichlorodifluoromethane in the LCS for batch 1b0702.b was low resulting "R" qualification for non-detect dichlorodifluoromethane data in Samples 84699-1, 84699-2, 84699-4, 84699-5, 84699-6, and 84699-7.

**SNW006** The positive result for bromomethane (7.1 ppb) in 84909-5 was qualified "J" due to a high recovery of bromomethane in the associated LCS.

### Regional Quality Assurance and Quality Control

Samples GW-11CC and GW-19AA were field duplicates of Samples GW-11C and GW-19A, respectively.

Analyte	GW-11C (ug/l)	GW-11CC (ug/l)	RPD
Acetone	42	39	7
Benzene	10	9.3	7
Carbon disulfide	7.1	3.5	68
cis-1,2-Dichloroethene	55	51	8
Trichloroethene	4.4	3.5	23
Trichlorofluoromethane	100	90	11

Analyte	GW-19A (ug/l)	GW-19AA (ug/l)	RPD
1,2-Dibromo—3-chloropropane	Non-detect (<100)	210	
Carbon tetrachloride	Non-detect (<100)	61	
Chlorobenzene	Non-detect (<100)	140	
cis-1,2-Dichloroethene	2400	2200	9
trans-1,2-Dichloroethene	130	85	42
Trichloroethene	8600	7500	14
Xylenes, Total	230	280	20

Estimates (J-flags) were not included in the tables.

### Internal Standards

Internal standard (IS) performance is an indication of GC/MS sensitivity and response during sample analyses. Internal standard criteria are two-fold: IS area counts must not vary by more than  $\pm 40$  percent from the associated 12-hour calibration standard; and the retention time of the IS must not vary by more than  $\pm 20$  seconds from the retention time of the associated 12-hour calibration standard.

### Target Compound Identification

Criteria for target compound identification minimize the number of erroneous compound identifications, both false positive and false negative, for GC/MS qualitative analysis, and

include examination of retention times as compared to standard retention times and sample compound mass spectra which match standard mass spectra. The following data was qualified "U" based on mass spectra criteria.

NV004 Cyclohexane and isopropyl benzene in 84319-1; total xylenes in 84319-2 and 84319-4; 1,3-dichlorobenzene in 84319-4.

SNW001 2-butanone in 84411-1 and 84411-2; chlorobenzene in 84411-1 and 84411-4; total xylenes in 84411-1, 84411-3, 84411-4, and 84411-5; 4-methyl-2-pentanone in 84411-4; styrene in 84411-5.

SNW002 Chlorobenzene in 84524-1, 84524-2, 84524-3, 84524-5, and 84524-6; 1,2-dichloroethane in 84524-5, 84524-7, and 84524-8; 1,1,1-trichloroethane in 84524-7.

SNW005 1,2-dichloroethane in 84699-2.

SNW006 Bromomethane in 84909-5; 2-butanone in 84863-1 and 84863-2 and in 84909-3 and 84909-4; chlorobenzene in 84863-1 and 84863-4 and in 84909-1 and 84909-2; 1,2-dichloroethane in 84863-2, 84863-3, and 84863-4 and in 84909-3 and 84909-6; MTBE in 84909-1 and 84909-4; toluene in 84909-1, 84909-3, 84909-5, and 84909-6.

SNW007 1,4-dichlorobenzene in 84958-3; styrene in 85103-1; chlorobenzene in 85103-6.

SNW07A 1,4-dichlorobenzene in 85049-1.

SNW008 Toluene and chlorobenzene in 85158-9.

SNW010 2-butanone in 85817-1, 85817-2, 85817-5, 85817-6 and in 85854-2 and 85854-4; 1,2-dichloroethane in 85817-1 and 85817-4; trans-1,2-dichloroethene in 85817-4 and in 85854-3; 1,4-dichlorobenzene in 85817-5; 1,2-dichloropropane in 85817-2; chlorobenzene in 85854-4 and 85854-5; trichloroethene in 85854-2.

### **Compound Quantitation and Reported CRQLs**

Compound quantitation must be calculated according to the correct equation, calculated based on the correct internal standard, based on the quantitation ion specified by the method for internal standards and analytes, and based on the RRF from the appropriate daily standard. CRQL adjustment must be calculated according to the appropriate equation.

### **System Performance**

System performance appears satisfactory over the period which samples of this analytical group were analyzed. No apparent changes in baseline shift or decrease in sensitivity are noted.

## **SEMIVOLATILE ORGANIC COMPOUNDS**

POTESTA, following the USEPA guidance "*USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*" dated October 1999, completed data validation procedures for the completed semivolatile organic compound analyses.

Samples listed by STL-Savannah laboratory identification numbers in Table 2 were analyzed for SVOCs by SW-846 Method 8270C.

### **Holding Times**

Technical holding time requirements for water matrices state that samples must be maintained at 4°C ( $\pm 2^\circ\text{C}$ ), extracted within 7 days of collection, and analyzed within 40 days of extraction.

SNW010 Sample 85817-1 was re-extracted outside of holding time for reanalysis (85817-1RE2) due to internal standard and surrogate issues. Data was not qualified as it concurred with the two previous runs (85817-1 and 85817-1RE).

### **GC/MS Instrument Performance Checks**

The laboratory performed required instrument performance checks with decafluorotriphenylphosphine at the beginning of each 12-hour analytical period on each instrument utilized for sample analysis. Each performance check met the required ion abundance criteria indicating the instruments were in tune and operating properly.

### **Initial Calibration**

Initial calibration data were reviewed with regard to relative response factors (RRFs), percent relative standard deviation (%RSD), calibration curve linearity, and standard concentrations.

SNW004 Non-detect results for benzaldehyde in Samples 84666-1 through 84666-6 were qualified "UJ" due to exceedance of the %RSD criterion.

SNW005 Non-detect results for benzaldehyde in samples 84773-1 through 84773-9 and 84699-1 through 84699-7 were qualified "UJ" due to exceedance of the %RSD criterion.

SNW006 Non-detect results for benzaldehyde in Samples 84863-1 through 84863-4 and 84909-1 through 84909-6 were qualified "UJ" due to exceedance of the %RSD criterion.

SNW007 Non-detect results for benzaldehyde in Samples 84958-1 through 84958-4 and 85103-1 through 85103-6 were qualified "UJ" due to exceedance of the %RSD criterion.

SNW07A Non-detect results for benzaldehyde in Samples 84995-1 through 84995-7 and 85049-1 through 85049-6 were qualified "UJ" due to exceedance of the %RSD criterion; the positive result in 84995-8 was "J" qualified.

SNW008 Non-detect results for benzaldehyde in samples 85158-1 through 85158-5 and 85158-7 through 85158-9 were qualified "UJ" due to exceedance of the %RSD criterion.

SNW009 Non-detect results for benzaldehyde in Samples 85421-1 through 85421-3 and 85386-1 through 85386-3 were qualified "UJ" due to exceedance of the %RSD criterion.

SNW010 Due to exceedance of the %RSD criterion, non-detect results for benzaldehyde in 85817-1RE2, 85817-6RE, and 85854-3 and parathion in 85817-3 and 85854-4 were qualified "UJ"; the positive result for ethyl parathion in 85817-5 was "J" qualified.

### **Continuing Calibration**

Continuing calibration (CC) evaluations were based on the following criteria: (1) continuing calibration analysis must be performed at the beginning of each 12-hour analytical period following the analysis of the instrument performance check and prior to the analysis of the method blank; (2) RRFs for each target compound and surrogate must be greater than or equal to 0.05; and (3) % Difference (%D) or % Drift, depending on the type of calibration curve as discussed in SW-846 Method 8000, must be within  $\pm 25\%$  of the initial calibration RRF or initial calibration amount.

NV004 Non-detect results for 1,1-biphenyl in Samples 84319-1 through 84319-4 were qualified "UJ" due to %D exceedance.

SNW001 Non-detect results for 1,1-biphenyl in Samples 84411-1 through 84411-5 were qualified "UJ" due to %D exceedance.

SNW005 Non-detect results for 1,1-biphenyl and benzo(k)fluoranthene in Samples 84773-1 through 84773-9 were qualified "UJ" due to %D exceedance.

SNW006 Non-detect results for benzaldehyde and ethyl parathion in Samples 84863-1 through 84863-4 and 84909-1 through 84909-6 were qualified "UJ" due to %D exceedance.

SNW007 Non-detect results for n-nitroso-di-n-propylamine and atrazine in 84958-3 and 84958-4; ethyl parathion in 85103-1 and 85103-2; and benzaldehyde in 85103-3RE, 85103-4, 85103-5RE, and 85103-6 were qualified "UJ" due to %D exceedance.

SNW07A Non-detect data for the following compounds were qualified "UJ" due to %D exceedance: 3-nitroaniline in 84995-1 through 84995-8; benzaldehyde in 85049-1, 85049-3, 85049-4, and 85049-5; n-nitroso-di-n-propylamine and atrazine in 85049-2 and 85049-6.

SNW008 Non-detect data for the following compounds were qualified "UJ" due to %D exceedance: benzaldehyde in 85158-3 and 85158-6; bis(2-chloroethyl)ether and bis(2-chloroisopropyl)ether in 85158-3; ethyl parathion in 85158-1, 85158-2, 85158-4 through 85158-9.

SNW009 Non-detect results for ethyl parathion in Samples 85421-1 through 85421-3 and 85386-1 through 85386-3 were qualified "UJ" due to exceedance of the %D criterion.

SNW010 Non-detect data for the following compounds were qualified "UJ" due to %D exceedance: benzaldehyde in 85817-1RE2, 85817-3, 85817-5, 85817-6RE and 85854-4; Acetophenone, 1,1-biphenyl, and ethyl parathion in 85817-2, 85817-4, 85854-2, and 85854-5; 2,4-dinitrophenol in 85817-1RE2 and -6RE.

### Blanks

The laboratory analyzed method blanks as part of the analytical QA/QC for this project work plan in order to identify any laboratory, background, and reagent contamination.

Blanks should contain no contamination. If a blank is found to be contaminated with one or more target analytes, then data qualification of the associated samples are determined based on the magnitude of the blank contamination as compared to the concentrations of the particular analytes in the samples. As a rule (5X rule), if the concentration of a particular analyte in a sample is less than 5 times the concentration of that same analyte in an associated blank, then the positive result for that analyte would be qualified as not detected (U). For the common phthalate contaminants, positive results would be qualified as not detected if the sample concentration was less than 10 times the concentration found in the blank (10X rule).

The following positive results were "U" qualified due to method blank contamination.

SNW003 Benzo(a)pyrene in 84572-1; indeno(1,2,3-cd)pyrene in 84572-1, 84572-2, 84572-3; dibenzo(a,h)anthracene in 84572-1, 84572-2, 84572-3, 84572-4; benzo(g,h,i)perylene in 84572-1, 84572-2, 84572-3, 84572-4.

SNW005 Indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene in 84773-1.

### Surrogate Spikes

Six system monitoring compounds (surrogate spikes), three acid compounds (2-fluorophenol, phenol-d5, 2,4,6-tribromophenol), and three base/neutral compounds (nitrobenzene-d5, 2-fluorobiphenyl, terphenyl-d14) were added to all samples and blanks.

Base/Neutral Compounds		
Aniline	dibenzofuran	bis(2-ethylhexyl)phthalate
bis(2-chloroethyl)ether	2,4-dinitrotulunene	chrysene
2,2'-oxybis(1-chloropropane)	diethylphthalate	di-n-octylphthalate
n-nitroso-di-n-propylamine	fluorene	benzo(b)fluoranthene
Hexachloroethane	4-chlorophenyl-phenylether	benzo(k)fluoranthene

Base/Neutral Compounds		
Nitrobenzene	4-nitroaniline	benzo(a)pyrene
Isophorone	n-nitrosodiphenylamine	indeno(1,2,3-cd)pyrene
bis(2-chloroethoxy)methane	4-bromophenyl-phenylether	dibenzo(a,h)anthracene
Naphthalene	hexachlorobenzene	benzo(g,h,i)perylene
4-chloroaniline	phenanthrene	acetophenone
Hexachlorobutadiene	anthracene	1,2,4,5-tetrachlorobenzene
2-methylnaphthalene	carbazole	1,1-biphenyl
hexachlorocyclopentadiene	di-n-butylphthalate	ethyl parathion
2-chloronaphthalene	Fluoranthene	Benzaldehyde
2-nitroaniline	Pyrene	Caprolactam
Dimethylphthalate	Butylbenzylphthalate	Atrazine
2,6-dinitrotoluene	3,3'-dichlorobenzidine	
Acenaphthene	Benzo(a)anthracene	

Acid Compounds	
Phenol	4-chloro-3-methylphenol
2-chlorophenol	2,4,6-trichlorophenol
o-cresol (2-methylphenol)	2,4,5-trichlorophenol
m&p-cresol (3-methyl/4-methylphenol)	2,4-dinitrophenol
2-nitrophenol	4-nitrophenol
2,4-dimethylphenol	4,6-dinitro-2-methylphenol
2,4-dichlorophenol	pentachlorophenol

**SNW006** Samples 84863-3, 84863-4 and 84909-3/-3DL (84909-3DL was a diluted run for aniline) each had at least two base/neutral surrogates with low recoveries with one (terphenyl-d14) exhibiting a recovery of less than 10%; each sample was reanalyzed with concurring results. As a result, non-detected base/neutral compounds were qualified "R" and positive results were qualified "J". Positive results were aniline in 84863-3, 84863-4, and 84909-3DL; bis(2-chloroethyl)ether in 84909-3; naphthalene and 4-chloroaniline in 84863-3, 84863-4, and 84909-3; and Dibenzo(a,h)anthracene in 84863-3 and 84863-4. All other base/neutral compounds were non-detect.

**SNW008** The surrogate compounds 2-fluorophenol (acid fraction) and terphenyl-d14 (base/neutral fraction) exhibited 0% recovery in sample 85158-6 resulting in "R" qualification of non-detected compounds and "J" qualification of detected compounds (aniline, 2-chlorophenol, 2,4-dichlorophenol, 4-chloroaniline, and 2,4,5-trichlorophenol).

**SNW010** Because of surrogate issues, data from reruns, 85817-1RE2 and 85817-6RE, were reported. Detected acid compounds, 2,4-dichlorophenol and 4-nitrophenol, were qualified "J"; non-detected acid compounds were qualified "UJ".

## Matrix Spikes/Matrix Spike Duplicates

Matrix spike/matrix spike duplicate data were evaluated on the basis of the CLP criteria for frequency (1 MS/MSD pair per 20 samples), spike recovery, and relative percent difference between spike and spike duplicate recoveries. MS/MSD criteria were not used solely as a basis for sample data qualification, but were used in conjunction with other criteria in determining data qualification.

## Laboratory Control Samples

Laboratory control sample (LCS) data are an indication of analytical accuracy and laboratory performance. A LCS must be analyzed at a frequency of 1 per 20 samples and contain the following compounds within QC limits: phenol, 2-chlorophenol, 4-chloroaniline, 2,4,6-trichlorophenol, bis(2-chloroethyl)ether, n-nitroso-di-n-propylamine, hexachloroethane, isophorone, naphthalene, 2,4-dinitrotoluene, diethylphthalate, n-nitrosodiphenylamine, hexachlorobenzene, and benzo(a)pyrene.

NV004 Due to laboratory error, a full LCS was not analyzed; there were no indications that data quality was compromised, so no action was taken.

SNW003 Non-detect data for aniline in Samples 84572-1, 84572-2, 84572-3, and 84572-4 were "R" qualified due to low recovery of aniline in the LCS.

SNW004 Non-detect data for aniline in Samples 84666-1 through 84666-6 were "R" qualified due to low recovery of aniline in the LCS.

SNW005 Non-detect data for aniline in Samples 84699-2, 84699-4 through 84699-7 were "R" qualified due to low recovery of aniline in the LCS; positive results for aniline in Samples 84699-1 and 84699-3 were qualified "J".

SNW07A Non-detect data for aniline in Samples 84995-1 through 84995-8 and 85049-1, 85049-2, 85049-4, 85049-5, and 85049-6 were "R" qualified due to low recovery of aniline in the LCS; the positive result in 85049-3DL was qualified "J".

## Regional Quality Assurance and Quality Control

Samples GW-11CC and GW-19AA were field duplicates of Samples GW-11C and GW-19A, respectively.

Analyte	GW-11C (ug/l)	GW-11CC (ug/l)	RPD
2,4-dichlorophenol	35	32	9
aniline	160	130	21
phenol	22	22	0

Estimates (J-flags) were not included in the table. Samples GW-19A and GW-19AA were free of analytes except for estimates for 2,4-dichlorophenol and 4-nitrophenol.

### **Internal Standards**

Internal standards (IS) performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Internal standard area counts must not vary by more than a factor of two (-50 percent to +100 percent) from the associated 12-hour standard; the retention time of the internal standards must vary by more than  $\pm 30$  seconds from the retention time of the associated 12-hour standard.

SNW005 Non-detect results for di-n-octylphthalate, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, Dibenzo(a,h)anthracene, and benzo(g,h,i)perylene in 84773-9 were qualified "UJ" due to low recovery of perylene-d<sub>12</sub>.

SNW007 Samples 85103-3 and 85103-5 were reanalyzed due to low internal standards recovery as 85103-3RE and 85103-5RE with better results; data from the latter runs will be utilized. Perylene-d<sub>12</sub> recovery remained low in the reanalyses resulting in "UJ" qualification of compounds quantitated by this IS including di-n-octylphthalate, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene.

SNW07A Sample 85049-3 exhibited low recovery of perylene-d<sub>12</sub> resulting in "UJ" qualification of compounds quantitated by this IS including di-n-octylphthalate, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene.

SNW010 Sample 85817-2 exhibited low recovery of 1,4-dichlorobenzene resulting in "UJ" qualification of benzaldehyde, phenol, bis-(2-chloroethyl)ether, 2-chlorophenol, 2-methylphenol, 2,2'-oxybis-(1-chloropropane), acetophenone, 3-methyl/4-methylphenol, n-nitroso-di-n-propylamine, and hexachloroethane.

### **Target Compound Identification**

Criteria for target compound identification minimize the number of erroneous compound identifications, both false positive and false negative, for GC/MS qualitative analysis, and include examination of retention times as compared to standard retention times and sample compound mass spectra which match standard mass spectra. The following data was qualified "U" based on mass spectra criteria.

### **Compound Quantitation and Reported CRQLs**

Compound quantitation must be calculated according to the correct equation, calculated based on the correct internal standard, based on the quantitation ion specified by the method for internal

standards and analytes, and based on the RRF from the appropriate daily standard. CRQL adjustment must be calculated according to the appropriate equation.

### **System Performance**

System performance appears satisfactory over the period which samples of this analytical group were analyzed. No apparent changes in baseline shift or decrease in sensitivity are noted.

### **CHLORINATED HERBICIDE ANALYSIS**

Data review guidelines for chlorinated herbicide analytical data by SW-846 Method 8151A are not included under the Contract Laboratory Program. Therefore, POTESEA has completed data validation procedures for the chlorinated herbicide analytical data in accordance with SW-846, Methods 8000B and 8151A.

### **Holding Times**

All samples were extracted within 14 days and analyzed within 40 days as required by SW-846.

### **Initial Calibration**

All analytes of interest must have %RSD values of less than or equal to 20.

### **Continuing Calibration**

Each analyte must fall within its respective retention time window and have a %D value of less than or equal to 15.

SNW010 Non-detect results for 2,4,5-T in 85817-6, 85854-2, and 85854-5 were qualified "UJ" due to %D exceedance; positive results for 2,4,5-T in 85817-1 through 85817-5, 85854-3, and 85854-4 were qualified "J".

### **Blanks**

A method blank should be analyzed before sample analyses are conducted in order to identify laboratory, background, and reagent contamination. Method blanks should contain no contamination. If a blank is found to be contaminated with one or more target analytes, then data qualification of the associated samples are determined based on the magnitude of the blank contamination as compared to the concentrations of the particular analytes in the samples. As a rule (5X rule), if the concentration of a particular analyte in a sample is less than 5 times the concentration of that same analyte in an associated blank, then the positive result for that analyte would be qualified as not detected (U).

## Surrogate Recoveries

Surrogate recoveries for all analyses must fall within quality control limits.

## Matrix Spikes/Matrix Spike Duplicates (MS/MSD)

A MS/MSD pair should be analyzed with each analytical batch.

## Laboratory Control Samples (LCS)

An LCS should be analyzed with each analytical batch and all spiked compounds should be within recovery limits.

## Regional Quality Assurance and Quality Control

Samples GW-11CC and GW-19AA were field duplicates of Samples GW-11C and GW-19A, respectively.

Analyte	GW-19A (ug/l)	GW-19AA (ug/l)	RPD
2,4,5-T	0.68	0.26	89
2,4,5-TP	12	12	0
2,4-D	3.2	3.7	14

Analyte	GW-11C (ug/l)	GW-11CC (ug/l)	RPD
2,4,5-T		2.9	
2,4,5-TP	4.2	8.4	67

## Target Compound Identification

Each identified compound must be within its respective retention time window, and the relative percent difference in concentrations between the two detectors should be less than or equal to 40%.

NV004 The RPD for 2,4-D exceeded QC limits in 84319-1, requiring that the positive result for 2,4-D be qualified "J".

SNW001 Positive results for 2,4,5-T in 84411-4 and 84411-5 were qualified "J" due to a greater than 40% difference in concentrations between detectors.

SNW005 The positive result for 2,4,5-T in 84699-2 was qualified "J" due to a greater than 40% difference in concentrations between detectors.

SNW006 Positive results for 2,4,5-T in 84863-4 and 2,4-D in 84909-1 were qualified "J" due to a greater than 40% difference in concentrations between detectors.

SNW007 Positive results for 2,4,5-T in 85103-5 and 2,4,5-TP in 85103-5 and 84958-2 were qualified "J" due to a greater than 40% difference in concentrations between detectors.

SNW07A Positive results for 2,4,5-T in 85049-3 and 2,4-D in 84995-4 were qualified "J" due to a greater than 40% difference in concentrations between detectors.

SNW008 The positive result for 2,4,5-T in 85158-6 was qualified "J" due to a greater than 40% difference in concentrations between detectors.

SNW009 Positive results for 2,4,5-T in 85386-2 and 85386-3, 2,4-D in 85386-2DL, and 2,4,5-TP in 85386-1 were "J" qualified due to a greater than 40% difference in concentrations between detectors.

SNW010 Positive results for 2,4,5-T and 2,4,5-TP in 85817-5 were qualified "J" due to a greater than 40% difference in concentrations between detectors.

## **INORGANIC DATA ANALYSIS**

POTESTA, following the USEPA guidance "*USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*" dated October 1999, completed data validation procedures for the completed inorganic data analysis for cyanide and metals including mercury. Samples were analyzed for metals including mercury by SW-846 Methods 6010B and 7470A; cyanide analysis was conducted according to SW-846 Method 9012A. The suffix -F was added to sample identifications to denote data for dissolved analytes.

### **Holding Times**

For aqueous matrices, the following holding time and preservation criteria apply: metals have a holding time of 180 days while maintained at 4°C ( $\pm 2^\circ\text{C}$ ) and pH < 2; mercury has a holding time of 28 days while maintained at 4°C ( $\pm 2^\circ\text{C}$ ) and pH < 2; cyanide a holding time of 14 days while maintained at 4°C ( $\pm 2^\circ\text{C}$ ) and pH > 12.

### **Calibration**

Calibration for cyanide, metals, and mercury must be performed every 24 hours or each time the instrument is set up, and the calibration curve must exhibit a correlation coefficient  $\geq 0.995$ . Continuing calibration verification (CCV) must be performed at a frequency of 10% or every two hours, and percent recoveries for initial and continuing calibrations must be within control limits.

## Blanks

The objective of blank analysis is to determine the existence and magnitude of laboratory contamination. Initial calibration blanks (ICB) should be analyzed after the analytical standards, but not before the initial calibration verification (ICV) during initial calibration. Continuing calibration blanks (CCB) should be analyzed at each wavelength used for analysis immediately after each ICV and CCV. CCBs should be analyzed at a 10% frequency or every two hours, whichever is more frequent. At least one preparation blank should be prepared and analyzed per SDG, or with each batch of samples digested, whichever comes first.

SNW001 Positive results for aluminum in Samples 84441-1, 84441-2, 84441-2F, 84441-3, 84441-3F, 84441-4, 84441-4F, 84441-5, and 84441-5F were qualified "J", and the negative result in 84441-1F was qualified "UJ" due to a negative result for aluminum in the preparation blank.

SNW002 Positive results for aluminum in Samples 84524-1, 84524-1F, 84524-2, 84524-2F, 84524-3, 84524-3F, 84524-4, 84524-4F, 84524-5, 84524-5F, 84524-6, 84524-6F, 84524-7, 84524-7F, 84524-8, 84524-8F, 84524-9, 84524-9F, 84524-10, and 84524-10F were qualified "J" due to a negative result for aluminum in the preparation blank.

SNW004 Positive results for aluminum in Samples 84666-1, 84666-1F, 84666-2, 84666-2F, 84666-3, 84666-3F, 84666-4, 84666-4F, 84666-5, 84666-5F, 84666-6, and 84666-6F were qualified "J" due to a negative result for aluminum in the preparation blank.

SNW005 Positive results for aluminum in Samples 84773-1, 84773-1F, 84773-2, 84773-2F, 84773-3, 84773-3F, 84773-4, 84773-4F, 84773-5, 84773-5F, 84773-6, 84773-6F, 84773-7, 84773-7F, -8, 84773-8F, 84773-9, and 84773-9F and 84699-1, 84699-1F, 84699-2, 84699-2F, 84699-3, 84699-3F, 84699-4, 84699-4F, 84699-5, 84699-5F, 84699-6, 84699-6F, 84699-7, and 84699-7F were qualified "J" due to a negative result for aluminum in the preparation blank.

SNW07A Positive results for aluminum in Samples 84995-1, 84995-1F, 84995-2, 84995-2F, 84995-3, 84995-3F, 84995-4, 84995-4F, 84995-5, 84995-6, 84995-6F, 84995-7, 84995-8, 85049-1, 85049-2, 85049-2F, 85049-3, 85049-3F, 85049-4, 85049-4F, 85049-5, 85049-5F, and 85049-6 were qualified "J" due to negative results for aluminum in initial calibration blanks and continuing calibration blanks.

Positive results for antimony in Samples 84995-7, 84995-7F, 85049-2, 85049-3F, 85049-5F, and 85049-6F were qualified "J" due to a negative result for antimony in the preparation blank.

Negative results for aluminum in Samples 84995-5F, 84995-7F, 84995-8F, 85049-1F, and 85049-6F were qualified "UJ" due to negative results for aluminum in initial calibration blanks and continuing calibration blanks.

Negative results for antimony in Samples 84995-1, 84995-1F, 84995-2, 84995-2F, 84995-3, 84995-3F, 84995-4, 84995-4F, 84995-5, 84995-5F, 84995-6, 84995-6F, 84995-8, 84995-8F, 85049-1, 85049-1F, 85049-2F, 85049-3, 85049-4, 85049-4F, 85049-5, and 85049-6 were qualified "UJ" due to a negative result for antimony in the preparation blank.

SNW009 Due to negative results in the preparation blank, positive results for vanadium in 85386-1, 85386-2, 85386-3 and 85421-1, 85421-2, 85421-3 were qualified "J"; positive results for aluminum in 85386-1, 85386-2, 85386-2F, 85386-3, 85386-3F and 85421-1, 85421-2, 85421-3 were qualified "J"; negative results for vanadium in 85386-1F, 85386-2F, 85386-3F and 85421-1F, 85421-2F, 85421-3F were qualified "UJ"; negative results for aluminum in 85386-1, 85421-1F, 85421-2F, and 85421-3F were qualified "UJ".

### **Inductively Coupled Plasma-Interference Check Sample (ICP-ICS – Metals Only)**

The ICP-ICS verifies the instruments ability to overcome interference. An ICP-ICS must be analyzed for every 20 samples consisting of two solutions: Solution A and Solution AB. Solution A consists of interferents, and Solution AB consists of interferents mixed with analytes. Recovery for each solution must be within  $\pm 20\%$  of the true value.

### **Laboratory Control Samples**

Laboratory control sample (LCS) data are an indication of analytical accuracy and laboratory performance. An LCS should be analyzed for each SDG or each preparation batch, whichever comes first. Percent recoveries must be within the prescribed control limits.

### **Duplicate Sample Analysis**

At least one duplicate sample should be prepared and analyzed for each SDG with control limit of 20% RPD.

SNW010 The relative percent difference for antimony exceeded QC limits resulting in "J" qualification for positive antimony results in 85817-1, 85817-1F, 85817-2, 85817-3, 85817-3F, 85817-4, 85817-6F, 85854-2F, 85854-3F, 85854-4F, and 85854-5F and "UJ" qualification for negative results in 85817-2F, 85817-4F, 85817-5, 85817-5F, 85817-6, 85854-1, 85854-1F, 85854-2, 85854-3, 85854-4, and 85854-5.

### **Spike Sample Analysis**

Spiked sample analysis provides information about the effect of sample matrix on sample preparation procedures and measurement methodology. A pre-digestion spike should be analyzed for each SDG and percent recoveries (%R) should be within control limits. When the pre-digestion spike is outside control limits and the sample result is less than four times the spike

added, a post-digestion spike should be performed for the analytes which did not meet the specified criteria. Spike recovery limits do not apply if the sample concentration is greater than or equal to four times the spike added.

SNW001 Positive results for aluminum in Samples 84441-1, 84441-2, 84441-2F, 84441-3, 84441-3F, 84441-4, 84441-4F, 84441-5, and 84441-5F and potassium in Samples 84441-1, 84441-1F, 84441-2, 84441-2F, 84441-3, 84441-3F, 84441-4, 84441-4F, 84441-5, and 84441-5F were "J" qualified due to exceedance of spike recovery limits.

SNW002 Positive results for aluminum, magnesium, and manganese in Samples 84524-1, 84524-1F, 84524-2, 84524-2F, 84524-3, 84524-3F, 84524-4, 84524-4F, 84524-5, 84524-5F, 84524-6, 84524-6F, 84524-7, 84524-7F, 84524-8, 84524-8F, 84524-9, 84524-9F, 84524-10, and 84524-10F were qualified "J" due to exceedance of spike recovery limits.

SNW004 Positive results for aluminum in Samples 84666-1, 84666-1F, 84666-2, 84666-2F, 84666-3, 84666-3F, 84666-4, 84666-4F, 84666-5, 84666-5F, 84666-6, and 84666-6F were qualified "J" due to exceedance of spike recovery limits.

SNW005 Positive results for aluminum and potassium in Samples 84773-1, 84773-1F, 84773-2, 84773-2F, 84773-3, 84773-3F, 84773-4, 84773-4F, 84773-5, 84773-5F, 84773-6, 84773-6F, 84773-7, 84773-7F, 84773-8, 84773-8F, 84773-9, and 84773-9F and 84699-1, 84699-1F, 84699-2, 84699-2F, 84699-3, 84699-3F, 84699-4, 84699-4F, 84699-5, 84699-5F, 84699-6, 84699-6F, 84699-7, and 84699-7F were qualified "J" due to exceedance of spike recovery limits.

SNW007 Positive results for aluminum and potassium in Samples 84958-1, 84958-1F, 84958-2, 84958-2F, 84958-3, 84958-3F, 84958-4, and 84958-4F and 85103-1, 85103-1F, 85103-2, 85103-2F, 85103-3, 85103-3F, 85103-4, 85103-4F, 85103-5, 85103-5F, 85103-6, and 85103-6F were qualified "J" due to exceedance of spike recovery limits.

SNW07A Positive results for copper in Samples 84995-1, 84995-1F, 84995-2, 84995-2F, 84995-3, 84995-3F, 84995-4, 84995-4F, 84995-5, 84995-5F, 84995-6, 84995-6F, 84995-7, 84995-8, 84995-8F, 85049-1, 85049-3, 85049-4, 85049-4F, 85049-5, 85049-5F, 85049-6, and 85049-6F were "J" qualified due to a spike recovery for copper which was outside QC limits.

Negative results for copper in Samples 84995-7F, 85049-1F, 85049-2, 85049-2F, and 85049-3F were "UJ" qualified due to a spike recovery for copper which was outside QC limits.

SNW008 Positive results for aluminum and potassium in Samples 85158-1, 85158-1F, 85158-2, 85158-2F, 85158-3, 85158-3F, 85158-4, 85158-4F, 85158-5, 85158-5F, 85158-6, 85158-6F, 85158-7, 85158-7F, 85158-8, 85158-8F, 85158-9, and 85158-9F were "J" qualified due to exceedance of spike recovery limits.

Due to low biased recovery, positive results for cyanide in 85158-3 and 85158-8 were qualified "J"; negative results in 85158-1, 85158-2, 85158-4, 85158-5, 85158-6, 85158-7, and 85158-9 were qualified "UJ".

SNW010 Due to low recovery, positive results for antimony in 85817-1, 85817-1F, 85817-2, 85817-3, 85817-3F, 85817-4, 85817-6F, 85854-2F, 85854-3F, 85854-4F, and 85854-5F were "J" qualified; negative results in 85817-2F, 85817-4F, 85817-5, 85817-5F, 85817-6, 85854-1, 85854-1F, 85854-2, 85854-3, 85854-4, and 85854-5 were "UJ" qualified.

### **ICP Serial Dilution (Metals Only)**

The serial dilution of samples determines whether or not significant physical or chemical interferences exist due to sample matrix. If the original sample concentration is sufficiently high (50x the method detection limit), the serial dilution (5x dilution) concentration should be within 10% of the original sample concentration.

SNW001 Positive results for potassium in Samples 84441-1, 84441-1F, 84441-2, 84441-2F, 84441-3, 84441-3F, 84441-4, 84441-4F, 84441-5, and 84441-5F and sodium in 84441-1, 84441-2, 84441-3, 84441-4, and 84441-5 were qualified "J" due to exceedance of serial dilution control limits.

SNW002 Positive results for aluminum in Samples 84524-1, 84524-2, 84524-3, 84524-4, 84524-5, 84524-6, 84524-7, 84524-8, 84524-9, and 84524-10 were qualified "J" due to exceedance of serial dilution control limits.

SNW003 Positive results for manganese in Samples 84572-1, 84572-2, 84572-3, and 84572-4 were qualified "J" due to exceedance of serial dilution control limits.

SNW004 Positive results for aluminum in Samples 84666-1F, 84666-2F, 84666-3F, 84666-4F, 84666-5F, and 84666-6F were qualified "J" due to exceedance of serial dilution control limits.

SNW005 Positive results for potassium and zinc in Samples 84773-1, 84773-1F, 84773-2, 84773-2F, 84773-3, 84773-3F, 84773-4, 84773-4F, 84773-5, 84773-5F, 84773-6, 84773-6F, 84773-7, 84773-7F, 84773-8, 84773-8F, 84773-9, and 84773-9F and 84699-1, 84699-1F, 84699-2, 84699-2F, 84699-3, 84699-3F, 84699-4, 84699-4F, 84699-5, 84699-5F, 84699-6, 84699-6F, 84699-7, and 84699-7F were qualified "J" due to exceedance of serial dilution control limits.

SNW007 Positive results for zinc in 84958-1, 84958-1F, 84958-2, 84958-2F, 84958-3, 84958-3F, 84958-4, and 84958-4F and 85103-1, 85103-1F, 85103-2, 85103-2F, 85103-3, 85103-3F, 85103-4, 85103-4F, 85103-5, 85103-5F, 85103-6, and 85103-6F were qualified "J" due to exceedance of serial dilution control limits.

**SNW07A** Positive results for zinc in 84995-1, 84995-2, 84995-3, 84995-4, 84995-5, 84995-6, 84995-7, 84995-8, 85049-1, 85049-2, 85049-3, 85049-4, 85049-5, and 85049-6 were qualified "J" due to exceedance of serial dilution control limits.

**SNW008** Positive results for potassium in 85158-1, 85158-1F, 85158-2, 85158-2F, 85158-3, 85158-3F, 85158-4, 85158-4F, 85158-5, 85158-5F, 85158-6, 85158-6F, 85158-7, 85158-7F, 85158-8, 85158-8F, 85158-9, and 85158-9F and zinc in 85158-1, 85158-2, 85158-3, 85158-4, 85158-5, 85158-6, 85158-7, 85158-8, and 85158-9 were qualified "J" due to exceedance of serial dilution control limits.

**SNW009** Positive results for zinc in 85386-1F, 85386-2F, 85386-3F and 85421-1F, 85421-2F, 85421-3F were qualified "J" due to exceedance of serial dilution control limits.

### Field Duplicates

Samples GW-11CC and GW-19AA were field duplicates of samples GW-11C and GW-19A, respectively. (All units are ug/l)

Analyte	GW-11C (Total)	GW-11CC (Total)	RPD	GW-11C (Dissolved)	GW-11CC (Dissolved)	RPD
Aluminum	490000	680000	32	600000	410000	38
Antimony	29	30	3	19	Non-detect(<100)	
Arsenic	150	230	42	180	150	18
Barium	2100	2900	32	2500	1700	38
Beryllium	74	91	21	76	56	30
Cadmium	15	19	24	15	11	31
Calcium	17000	19000	11	16000	12000	29
Chromium	1200	1600	29	1400	1000	33
Cobalt	470	640	31	510	370	32
Copper	1800	2600	36	2200	1600	32
Iron	1000000	1400000	33	1200000	840000	35
Lead	1600	2300	36	1900	1400	30
Magnesium	47000	65000	32	53000	37000	36
Manganese	6700	8800	27	7100	5300	29
Nickel	870	1200	32	970	710	31
Potassium	53000	67000	23	66000	45000	38
Selenium	72	86	18	92	58	45
Silver						
Sodium	990000	1100000	11	1000000	950000	5
Thallium						
Vanadium	1500	2000	29	1700	1200	34
Zinc	7500	9600	25	7900	5900	29
Mercury	7500	9600	25	7900	5900	29

Analyte	GW-19A (Total)	GW-19AA (Total)	RPD	GW-19A (Dissolved)	GW-19AA (Dissolved)	RPD
Aluminum	20000	29000	37	19	19	0
Antimony						
Arsenic	6	12	67			
Barium	100	140	33	24	22	9
Beryllium	1.8	2.6	36			
Cadmium	6.2	6.6	6	4.7	4.5	4
Calcium	200000	200000	0	180000	180000	0
Chromium	24	38	45			
Cobalt	91	100	9	85	85	0
Copper	49	67	31	67	30	76
Iron	35000	56000	46	160	130	21
Lead	21	30	35	12		200
Magnesium	75000	77000	3	68000	66000	3
Manganese	17000	19000	11	20000	20000	0
Nickel	68	83	20	39	35	11
Potassium	5700	6900	19	1600	1500	6
Selenium						
Silver						
Sodium	140000	140000	0	140000	130000	7
Thallium		5.9	200	8.4	7.7	9
Vanadium	36	55	42			
Zinc	150	200	29	740	190	118
Mercury	0.2	0.16	22	0.1	0.089	12

### **DIOXINS/FURANS ANALYSIS**

For evaluation of data for this project, POTE STA utilized "USEPA Contract Laboratory Program National Functional Guidelines for Chlorinated Dioxin/Furan Data Review," EPA-540-R-02-003, August 2002.

Samples listed by STL-Sacramento laboratory identification numbers in Table 2 were analyzed for polychlorinated dibenzo-p-dioxins (dioxins) and polychlorinated dibenzofurans (furans) by EPA Method 1613B.

### **Holding Times**

Water samples must be stored at 4°C (±2°C) in the dark from the time of sample collection until extraction. In the presence of residual chlorine, 80 mg of sodium thiosulfate per liter of sample must be added. If the sample pH is >9, the sample pH must be adjusted to pH 7-9 with sulfuric acid. Samples may be stored for up to 1 year before extraction and extracts may also be stored for up to 1 year.

G3F230147 Sample temperatures exceeded 6°C during shipping. As a result, all data for Samples -001 through -010, which were non-detect for all compounds, were qualified "UJ".

G3G120155 There was a discrepancy between the chain of custody and container label with regard to the sample collection time for Sample -002. The correct collection time was 12:30 as was listed on the container label.

G3G290199 There was a discrepancy between the chain of custody and container label with regard to the sample collection date for Sample -001. The correct collection date was July 25, 2003 as listed on the chain of custody.

### **Mass Calibration and Mass Spectrometer Resolution**

Verification must be provided that instruments utilized in sample analyses have met the minimum resolution requirements of  $\geq 10,000$  for perfluorokerosene at the beginning of the 12-hour analytical period.

### **Window Defining Mix**

A window defining mix must be analyzed during each 12-hour analytical period on instruments equipped with a DB-5 column demonstrating appropriate switching times for selected ion monitoring time descriptors.

### **Chromatographic Resolution**

Satisfactory chromatographic resolution must be demonstrated by the analysis of a column performance solution during each 12-hour analytical period. Instrument set up with DB-5 columns should demonstrate peak separations between the 2, 3, 7, 8 – TCDD and 1, 2, 3, 8 – TCDD with a valley less than 25% of the peak height of 2, 3, 7, 8 – TCDD.

### **Instrument Stability**

Midpoint (C3) standards must be analyzed at the beginning of the 12-hour analytical period with regard to retention times, relative retention times, ion abundance ratios, signal-to-noise ratios, and response.

### **Initial Calibration**

Initial calibration of instruments utilized for sample analyses must meet the minimum criteria set forth by the USEPA regarding resolution, ion abundance, retention time, sensitivity, linearity, concentration, and frequency.

## **Calibration Verification**

Calibration verification must be performed at the beginning of the 12-hour analytical period on each instrument utilized for sample analyses with regard to retention times, relative retention times, ion abundance ratios, signal-to-noise ratios, and response of a midpoint (C3) standard.

## **Identification Criteria**

Identified compounds must meet criteria: (1) retention times and ion current responses for the quantitation ions must maximize within 2 seconds, (2) the signal-to-noise ratio for each native analyte ion must be at least 2.5 times the background noise, (3) and ion abundance ratio criteria for native and labeled analytes must be met.

## **Method Blanks**

Method blanks should not contain any interference above the contract required quantitation limit at the m/z of the specified.

G3F170175 Positive results for total TCDD in Samples -002, -003, and -004 were "U" qualified due to blank contamination.

G3G290199 Positive results for 2,3,7,8-TCDD and total TCDD in Sample -004 were qualified "U" and "J", respectively, due to blank contamination.

## **Laboratory Control Samples**

The laboratory must prepare and analyze an LCS for each SDG, and all spiked compounds must be within QC limits.

## **Labeled Compound Recoveries**

Recovery of the labeled compounds is an indication of laboratory's and method's effectiveness in extracting compounds of interest. All samples should meet criteria for recovery, signal/noise ratio, and ion abundance ratio of labeled compounds.

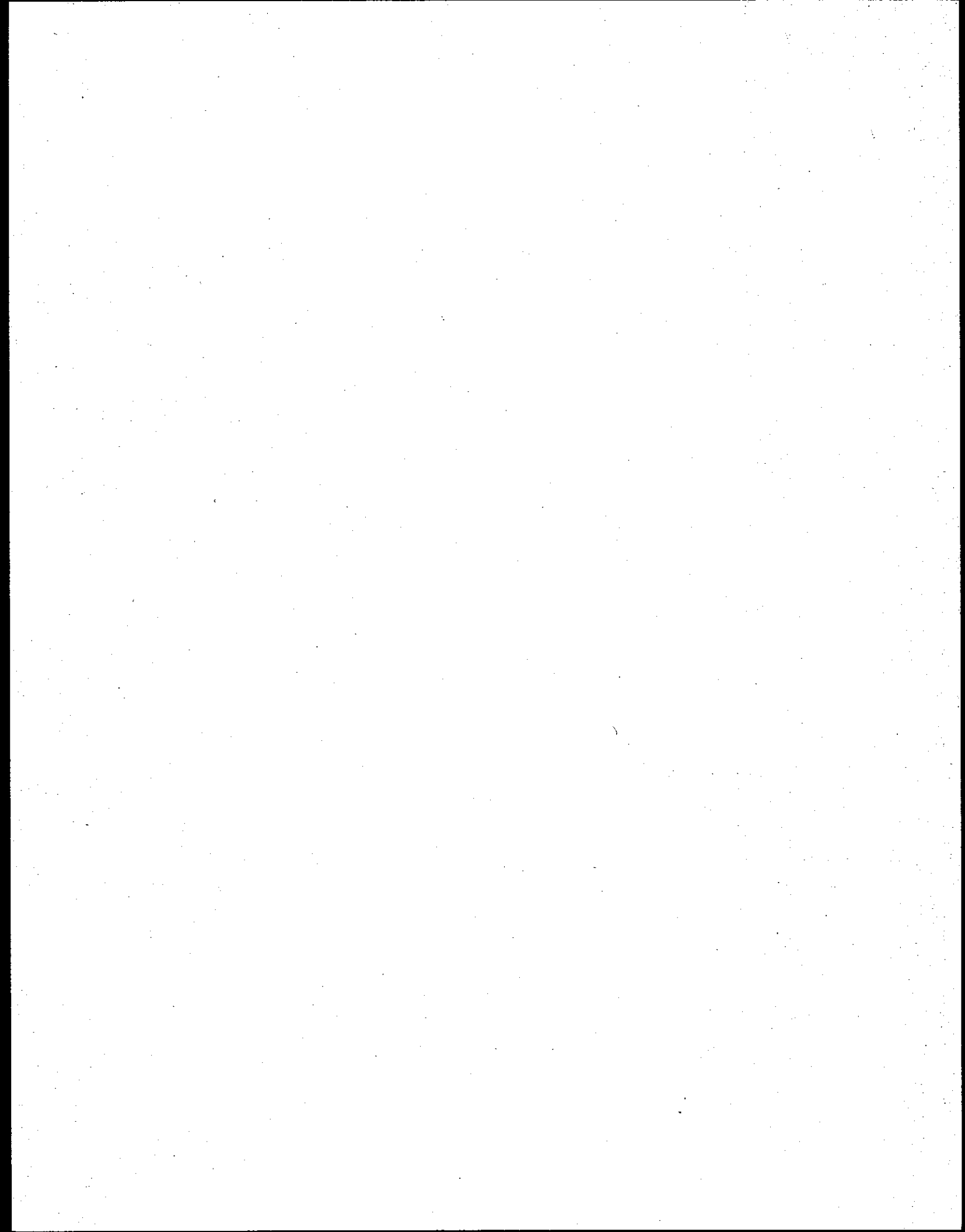
G3F140168 The internal standard recovery for 13C-1,2,3,4,7,8-HxCDD was low in Sample -004 resulting in "UJ" qualification of the non-detect result for 1,2,3,4,7,8-HxCDD.

## **Regional Quality Assurance and Quality Control**

Samples GW-11CC and GW-19AA were field duplicates of samples GW-11C and GW-19A, respectively.

<b>Analyte</b>	<b>GW-11C (ug/l)</b>	<b>GW-11CC (ug/l)</b>	<b>RPD</b>
OCDD	2000	1800	11
Total HPCDD	160	150	6
Total HXCDD	30	32	6
Total TCDD	11	11	0

Samples GW-19A and GW-19AA were free of analytes.



# CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION DATA QUALIFIER SUMMARY

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	NV004				SNW002									
SAMPLE ID	S384319-1	S384319-2	S384319-3	S384319-4	S384524-1	S384524-2	S384524-3	S384524-4	S384524-5	S384524-6	S384524-7	S384524-8	S384524-9	S384524-10
SAMPLE NAME	GW-25A	GW-25B	GW-25C	GW-26C	GW-32B	GW-32A	GW-32C	GW-31C	GW-31A	GW-30C	GW-30A	GW-33A	GW-30B	GW-33C
COMPOUND (8260, VOCs)														
1,1,1-Trichloroethane											U			
1,1,2,2-Tetrachloroethane														
1,1,2-Trichloro-1,2,2-trifluoroethane														
1,1,2-Trichloroethane														
1,1-Dichloroethane														
1,1-Dichloroethene														
1,2,3-Trichlorobenzene														
1,2,4-Trichlorobenzene			U											
1,2-Dibromo-3-chloropropane														
1,2-Dichlorobenzene														
1,2-Dichloroethane									U		U	U		
1,2-Dichloropropane														
1,3-Dichlorobenzene				U										
1,4-Dichlorobenzene														
2-Butanone (MEK)					U		U	U			U	U	U	U
2-Hexanone														
4-Methyl-2-pentanone (MIBK)														
Acetone					U	U	U	U		U	U			
Benzene			U		U		U						U	
Bromodichloromethane														
Bromoform														
Bromomethane (Methyl bromide)														
Carbon disulfide														
Carbon tetrachloride														
Chlorobenzene					U	U	U		U	U				
Chloroethane	UJ	UJ	UJ	UJ										
Chloroform														
Chloromethane	UJ	UJ	J											
cis-1,2-Dichloroethene														
Cyclohexane	UJ	UJ	UJ											
Dichlorodifluoromethane	R	R	R											
Ethylbenzene		U	U	U	U					U		U	U	
Isopropylbenzene	U													
Methyl acetate	UJ	UJ	UJ	UJ										
Methyl t-butyl ether (MTBE)	J	UJ	UJ											
Methylcyclohexane	UJ	UJ	UJ											
Methylene chloride (Dichloromethane)	R	R	R											
Styrene	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Tetrachloroethene														
Toluene		U	U	U	U	U	U	U	U	U		U	U	U
trans-1,2-Dichloroethene	UJ	UJ	UJ											
Trichloroethene						U				U				
Trichlorofluoromethane	R	R	R											
Vinyl chloride														
Xylenes, Total		U		U	U				U	U			U	

U = Analyte not detected.

UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unuseable, presence or absence of analyte cannot be verified.

**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW004						SNW003			
SAMPLE ID	S384666-1	S384666-2	S384666-3	S384666-4	S384666-5	S384666-6	S384572-1	S384572-2	S384572-3	S384572-4
SAMPLE NAME	GW-24C	GW-24A	GW-24B	GW-27A	GW-27C	GW-27B	GW-31B	GW-33B	GW-28C	GW-28A
COMPOUND (8260, VOCs)										
1,1,1-Trichloroethane										
1,1,2,2-Tetrachloroethane										
1,1,2-Trichloro-1,2,2-trifluoroethane							UJ	UJ	UJ	UJ
1,1,2-Trichloroethane										
1,1-Dichloroethane										
1,1-Dichloroethene										
1,2,3-Trichlorobenzene										
1,2,4-Trichlorobenzene										
1,2-Dibromo-3-chloropropane										
1,2-Dichlorobenzene										
1,2-Dichloroethane										
1,2-Dichloropropane										
1,3-Dichlorobenzene										
1,4-Dichlorobenzene										
2-Butanone (MEK)										
2-Hexanone										
4-Methyl-2-pentanone (MIBK)										
Acetone	U	U		U		U				
Benzene										
Bromodichloromethane										
Bromoform										
Bromomethane (Methyl bromide)	R	R	R	R	R	R				
Carbon disulfide										
Carbon tetrachloride										
Chlorobenzene										
Chloroethane	UJ	UJ	UJ	UJ	UJ	UJ				
Chloroform										
Chloromethane										
cis-1,2-Dichloroethene										
Cyclohexane										
Dichlorodifluoromethane										
Ethylbenzene		U		U						
Isopropylbenzene										
Methyl acetate										
Methyl t-butyl ether (MTBE)										
Methylcyclohexane										
Methylene chloride (Dichloromethane)										
Styrene	U			U	U	U				
Tetrachloroethene										
Toluene										
trans-1,2-Dichloroethene										
Trichloroethene										
Trichlorofluoromethane										
Vinyl chloride										
Xylenes, Total										

U = Analyte not detected.

UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unusable, presence or absence of analyte cannot be verified.

**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW005															
SAMPLE ID	S384699-1	S384699-2	S384699-3	S384699-4	S384699-5	S384699-6	S384699-7	S384773-1	S384773-2	S384773-3	S384773-4	S384773-5	S384773-6	S384773-7	S384773-8	S384773-9
SAMPLE NAME	GW-22A	GW-22B	GW-22C	GW-23A	GW-23B	GW-23C	GW-28B	GW-3A	GW-3B	GW-3C	GW-34A	GW-34B	GW-34C	GW-10A	GW-10B	GW-10C
COMPOUND (8260, VOCs)																
1,1,1-Trichloroethane																
1,1,2,2-Tetrachloroethane																
1,1,2-Trichloro-1,2,2-trifluoroethane																
1,1,2-Trichloroethane																
1,1-Dichloroethane																
1,1-Dichloroethene																
1,2,3-Trichlorobenzene																
1,2,4-Trichlorobenzene																
1,2-Dibromo-3-chloropropane																
1,2-Dichlorobenzene																
1,2-Dichloroethane		U	UJ													
1,2-Dichloropropane																
1,3-Dichlorobenzene																
1,4-Dichlorobenzene																
2-Butanone (MEK)			UJ													
2-Hexanone																
4-Methyl-2-pentanone (MIBK)																
Acetone																
Benzene																
Bromodichloromethane																
Bromoform																
Bromomethane (Methyl bromide)								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Carbon disulfide																
Carbon tetrachloride										U					U	
Chlorobenzene																
Chloroethane	UJ	J	UJ	UJ	UJ	UJ	UJ									
Chloroform																
Chloromethane																
cis-1,2-Dichloroethene			UJ													
Cyclohexane																
Dichlorodifluoromethane	R	R		R	R	R	R									
Ethylbenzene							R									
Isopropylbenzene																
Methyl acetate																
Methyl t-butyl ether (MTBE)																
Methylcyclohexane																
Methylene chloride (Dichloromethane)																
Styrene				U												
Tetrachloroethene																
Toluene																
trans-1,2-Dichloroethene																
Trichloroethene																
Trichlorofluoromethane																
Vinyl chloride																
Xylenes, Total																

U = Analyte not detected.

UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unusable, presence or absence of analyte cannot be verified.

**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW006									
SAMPLE ID	S384863-1	S384863-2	S384863-3	S384863-4	S384909-1	S384909-2	S384909-3	S384909-4	S384909-5	S384909-6
SAMPLE NAME	GW-11A	GW-11B	GW-11C	GW-11CC	GW-6A	GW-6B	GW-6C	GW-14A	GW-14B	GW-14C
COMPOUND (8260, VOCs)										
1,1,1-Trichloroethane										
1,1,2,2-Tetrachloroethane										
1,1,2-Trichloro-1,2,2-trifluoroethane	UJ	UJ	UJ	UJ						
1,1,2-Trichloroethane										
1,1-Dichloroethane										
1,1-Dichloroethene										
1,2,3-Trichlorobenzene										
1,2,4-Trichlorobenzene										
1,2-Dibromo-3-chloropropane										
1,2-Dichlorobenzene										
1,2-Dichloroethane		U	U	U			U			U
1,2-Dichloropropane										
1,3-Dichlorobenzene										
1,4-Dichlorobenzene										
2-Butanone (MEK)	U	U	J	J			U	U		U
2-Hexanone										
4-Methyl-2-pentanone (MIBK)										
Acetone						U		U	U	U
Benzene						U		U		
Bromodichloromethane										
Bromoform										
Bromomethane (Methyl bromide)	R	R	R	R					U	
Carbon disulfide										
Carbon tetrachloride										
Chlorobenzene	U			U	U	U				
Chloroethane	UJ	UJ	UJ	UJ						
Chloroform										
Chloromethane										
cis-1,2-Dichloroethene										
Cyclohexane										
Dichlorodifluoromethane	UJ	UJ	UJ	UJ						
Ethylbenzene							U	U	U	U
Isopropylbenzene										
Methyl acetate										
Methyl t-butyl ether (MTBE)					U	U	U	U		
Methylcyclohexane										
Methylene chloride (Dichloromethane)										
Styrene	U	U	U	U		U	U	U	U	
Tetrachloroethene										
Toluene					U		U		U	U
trans-1,2-Dichloroethane										
Trichloroethene					J					U
Trichlorofluoromethane										
Vinyl chloride										
Xylenes, Total							U	U		U

U = Analyte not detected.

UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unuseable, presence or absence of analyte cannot be verified.

**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW007									
SAMPLE ID	S384958-1	S384958-2	S384958-3	S384958-4	S385103-1	S385103-2	S385103-3	S385103-4	S385103-5	S385103-6
SAMPLE NAME	GW-8B	GW-8C	GW-16B	GW-16C	GW-2A	GW-2B	GW-2C	GW-5A	GW-5B	GW-5C
COMPOUND (8260, VOCs)										
1,1,1-Trichloroethane										
1,1,2,2-Tetrachloroethane										
1,1,2-Trichloro-1,2,2-trifluoroethane										
1,1,2-Trichloroethane										
1,1-Dichloroethane										
1,1-Dichloroethene										
1,2,3-Trichlorobenzene										
1,2,4-Trichlorobenzene										
1,2-Dibromo-3-chloropropane										
1,2-Dichlorobenzene										
1,2-Dichloroethane										
1,2-Dichloropropane										
1,3-Dichlorobenzene										
1,4-Dichlorobenzene			U							
2-Butanone (MEK)							U			U
2-Hexanone										
4-Methyl-2-pentanone (MIBK)					U					
Acetone		U		U	U	U	U		U	
Benzene						U	U			
Bromodichloromethane										
Bromoform										
Bromomethane (Methyl bromide)										
Carbon disulfide										
Carbon tetrachloride										
Chlorobenzene									U	U
Chloroethane										
Chloroform										
Chloromethane										
cis-1,2-Dichloroethene				U						
Cyclohexane										
Dichlorodifluoromethane					UU	UU	UU	UU	UU	
Ethylbenzene		U				U	U		U	
Isopropylbenzene										
Methyl acetate										
Methyl t-butyl ether (MTBE)										
Methylcyclohexane										
Methylene chloride (Dichloromethane)										
Styrene					U	U	U		U	
Tetrachloroethene										
Toluene										
trans-1,2-Dichloroethene										
Trichloroethene										
Trichlorofluoromethane										
Vinyl chloride										
Xylenes, Total						U	U		U	U

U = Analyte not detected.

UU = Analyte not detected, but quantitation limit estimated.

R = Data is unuseable, presence or absence of analyte cannot be verified.

**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW07A													
SAMPLE ID	S384995-1	S384995-2	S384995-3	S384995-4	S384995-5	S384995-6	S384995-7	S384995-8	S385049-1	S385049-2	S385049-3	S385049-4	S385049-5	S385049-6
SAMPLE NAME	GW-9A	GW-13A	GW-13B	GW-13C	GW-15A	GW-15B	GW-15C	GW-16A	GW-8A	GW-8B	GW-8C	GW-12A	GW-12B	GW-12C
COMPOUND (8260, VOCs)														
1,1,1-Trichloroethane														
1,1,2,2-Tetrachloroethane														
1,1,2-Trichloro-1,2,2-trifluoroethane														
1,1,2-Trichloroethane														
1,1-Dichloroethane														
1,1-Dichloroethene														
1,2,3-Trichlorobenzene														
1,2,4-Trichlorobenzene														
1,2-Dibromo-3-chloropropane														
1,2-Dichlorobenzene														
1,2-Dichloroethane														
1,2-Dichloropropane														
1,3-Dichlorobenzene														
1,4-Dichlorobenzene									U					
2-Butanone (MEK)														
2-Hexanone														
4-Methyl-2-pentanone (MIBK)														
Acetone		U			U	U	U							U
Benzene		U			U	U	U	U				U	U	U
Bromodichloromethane														
Bromoform														
Bromomethane (Methyl bromide)	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Carbon disulfide														
Carbon tetrachloride														
Chlorobenzene														
Chloroethane														
Chloroform														
Chloromethane														
cis-1,2-Dichloroethene														
Cyclohexane														
Dichlorodifluoromethane														
Ethylbenzene	U			U										
Isopropylbenzene														
Methyl acetate														
Methyl t-butyl ether (MTBE)														
Methylcyclohexane														
Methylene chloride (Dichloromethane)														
Styrene					U	U	U		U			U	U	U
Tetrachloroethene														
Toluene														
trans-1,2-Dichloroethene														
Trichloroethene														
Trichlorofluoromethane														
Vinyl chloride														
Xylenes, Total					U	U	U					U	U	

U = Analyte not detected.

UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unusable, presence or absence of analyte cannot be verified.

# CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION DATA QUALIFIER SUMMARY

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW009						SNW010										
SAMPLE ID	S385386-1	S385386-2	S385386-3	S385421-1	S385421-2	S385421-3	S385817-1	S385817-2	S385817-3	S385817-4	S385817-5	S385817-6	S385854-1	S385854-2	S385854-3	S385854-4	S385854-5
SAMPLE NAME	GW-17A	GW-18A	GW-19AA	GW-20A	GW-21A	GW-18A	GW-19B	GW-19C	GW-20B	GW-20C	GW-21B	GW-21C	GW-17B	GW-18B	GW-18C	GW-17C	GW-EDB
COMPOUND (8260, VOCs)																	
1,1,1-Trichloroethane																	
1,1,2,2-Tetrachloroethane																	
1,1,2-Trichloro-1,2,2-trifluoroethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
1,1,2-Trichloroethane																	
1,1-Dichloroethane																	
1,1-Dichloroethene																	
1,2,3-Trichlorobenzene																	
1,2,4-Trichlorobenzene																	
1,2-Dibromo-3-chloropropane																	
1,2-Dichlorobenzene																	
1,2-Dichloroethane							U		UJ	U							
1,2-Dichloropropane								U									
1,3-Dichlorobenzene																	
1,4-Dichlorobenzene											U						
2-Butanone (MEK)							U	U			U	U		U			U
2-Hexanone																	
4-Methyl-2-pentanone (MIBK)																	
Acetone							U	U		U	U	U				J	J
Benzene																	
Bromodichloromethane																	
Bromoform							UJ	UJ		UJ	UJ	UJ			UJ	UJ	UJ
Bromomethane (Methyl bromide)	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Carbon disulfide																	
Carbon tetrachloride																	
Chlorobenzene																U	U
Chloroethane																	
Chloroform																	
Chloromethane																	
cis-1,2-Dichloroethene																	
Cyclohexane																	
Dichlorodifluoromethane																	
Ethylbenzene																U	U
Isopropylbenzene																	
Methyl acetate																	
Methyl t-butyl ether (MTBE)																	
Methylcyclohexane																	
Methylene chloride (Dichloromethane)																	
Styrene										U				U	U	U	U
Tetrachloroethene														U			
Toluene																	
trans-1,2-Dichloroethene										U						U	
Trichloroethene																	
Trichlorofluoromethane																	
Vinyl chloride																	
Xylenes, Total																	U

U = Analyte not detected.  
 UJ = Analyte not detected, but quantitation limit estimated.  
 R = Data is unuseable, presence or absence of analyte cannot be verified.

# CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION DATA QUALIFIER SUMMARY

Flexsys America L.P.  
Nitro, West Virginia

SDG	SNW008									SNW001				
SAMPLE ID	S385158-1	S385158-2	S385158-3	S385158-4	S385158-5	S385158-6	S385158-7	S385158-8	S385158-9	S384411-1	S384411-2	S384411-3	S384411-4	S384411-5
SAMPLE NAME	GW-1A	GW-1B	GW-1C	GW-4A	GW-4B	GW-4C	GW-7A	GW-7B	GW-7C	GW-26A	GW-26B	GW-26C	GW-26A	GW-26B
COMPOUND (8260, VOCs)														
1,1,1-Trichloroethane														
1,1,2,2-Tetrachloroethane														
1,1,2-Trichloro-1,2,2-trifluoroethane						UJ		UJ	UJ					
1,1,2-Trichloroethane														
1,1-Dichloroethane														
1,1-Dichloroethene														
1,2,3-Trichlorobenzene														
1,2,4-Trichlorobenzene											R			
1,2-Dibromo-3-chloropropane														
1,2-Dichlorobenzene														
1,2-Dichloroethane														
1,2-Dichloropropane														
1,3-Dichlorobenzene														
1,4-Dichlorobenzene														
2-Butanone (MEK)										U	U			
2-Hexanone														
4-Methyl-2-pentanone (MIBK)													U	
Acetone											U	U	U	U
Benzene														
Bromodichloromethane														
Bromoform														
Bromomethane (Methyl bromide)						UJ		UJ	UJ					
Carbon disulfide														
Carbon tetrachloride														
Chlorobenzene										U	U		U	
Chloroethane														
Chloroform														
Chloromethane														
cis-1,2-Dichloroethene		U	U											
Cyclohexane														
Dichlorodifluoromethane	UJ	UJ	UJ	UJ	UJ		UJ							
Ethylbenzene														
Isopropylbenzene														
Methyl acetate														
Methyl t-butyl ether (MTBE)														
Methylcyclohexane														
Methylene chloride (Dichloromethane)														
Styrene										U		U	U	U
Tetrachloroethene			U				U							
Toluene									U	U	U	U	U	U
trans-1,2-Dichloroethene														
Trichloroethene		U	U				U			U	U	U	U	
Trichlorofluoromethane														
Vinyl chloride							U		U					
Xylenes, Total										U		U	U	U

U = Analyte not detected.

UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unusable, presence or absence of analyte cannot be verified.



# CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION DATA QUALIFIER SUMMARY

Flexsys America L.P.  
Nitro, West Virginia

SDG	NV004				SNW002										SNW004					
SAMPLE ID	S384319-1	S384319-2	S384319-3	S384319-4	S384524-1	S384524-2	S384524-3	S384524-4	S384524-5	S384524-6	S384524-7	S384524-8	S384524-9	S384524-10	S384668-1	S384668-2	S384668-3	S384668-4	S384668-5	S384668-6
SAMPLE NAME	GW-25A	GW-25B	GW-25C	GW-26C	GW-32B	GW-32A	GW-32C	GW-31C	GW-31A	GW-30C	GW-30A	GW-33A	GW-30B	GW-33C	GW-24C	GW-24A	GW-24B	GW-27A	GW-27C	GW-27B
COMPOUND (8270, SVOCs)																				
1,1-Biphenyl	U	U	U	U																
4-Bromophenyl-phenylether																				
1,2,4,5-Tetrachlorobenzene																				
2,4,5-Trichlorophenol																				
2,4,6-Trichlorophenol																				
2,4-Dichlorophenol																				
2,4-Dimethylphenol																				
2,4-Dinitrotoluene																				
2,6-Dinitrotoluene																				
2,4-Dinitrophenol																				
4,6-dinitro-2-methylphenol																				
2-Chloronaphthalene																				
2-Chlorophenol																				
4-Chlorophenyl-phenylether																				
2-Methylnaphthalene																				
2-Methylphenol (o-Cresol)																				
3,3'-Dichlorobenzidine																				
3-Methylphenol/4-Methylphenol (m&p-Cresol)																				
4-Chloroaniline																				
4-Chloro-3-methylphenol																				
2-Nitroaniline																				
3-Nitroaniline																				
4-Nitroaniline																				
4-Nitrophenol																				
2,2'-oxybis(1-chloropropane)																				
Acenaphthene																				
Acetophenone																				
Aniline															R	R	R	R	R	R
Anthracene																				
Atrazine																				
Benzaldehyde															U	U	U	U	U	U
Benzo(a)anthracene																				
Benzo(a)pyrene																				
Benzo(g,h,i)perylene																				
Benzo(b)fluoranthene																				
Benzo(k)fluoranthene																				
bis(2-Chloroethoxy)methane																				
bis(2-chloroisopropyl)ether																				
bis(2-Chloroethyl)ether																				
bis(2-Ethylhexyl)phthalate																				
Butylbenzylphthalate																				
Caprolactam																				
Carbazole																				
Chrysene																				
Dibenzo(a,h)anthracene																				
Dibenzofuran																				
Diethylphthalate																				
Dimethylphthalate																				
Di-n-butylphthalate																				
Di-n-octylphthalate																				
Fluoranthene																				
Fluorene																				
Hexachlorobenzene																				
Hexachlorobutadiene																				
Hexachlorocyclopentadiene																				
Hexachloroethane																				
Indeno(1,2,3-cd)pyrene																				
Isophorone																				
Naphthalene																				
Nitrobenzene																				
Ethyl parathion																				
N-Nitroso-di-n-propylamine																				
N-Nitrosodiphenylamine																				
Pentachlorophenol																				
Phenanthrene																				
Phenol																				
Pyrene																				

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UU = Analyte not detected, but quantitation limit estimated.

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# CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION DATA QUALIFIER SUMMARY

Flexsys America L.P.  
Nitro, West Virginia

SDG	SNW003										SNW005									
SAMPLE ID	S384572-1	S384572-2	S384572-3	S384572-4	S384699-1	S384699-2	S384699-3	S384699-4	S384699-5	S384699-6	S384699-7	S384773-1	S384773-2	S384773-3	S384773-4	S384773-5	S384773-6	S384773-7	S384773-8	S384773-9
SAMPLE NAME	GW-31B	GW-33B	GW-28C	GW-28A	GW-22A	GW-22B	GW-22C	GW-23A	GW-23B	GW-23C	GW-28B	GW-3A	GW-3B	GW-3C	GW-34A	GW-34B	GW-34C	GW-10A	GW-10B	GW-10C
COMPOUND (8270, SVOCs)																				
1,1-Biphenyl												UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
4-Bromophenyl-phenylether																				
1,2,4,5-Tetrachlorobenzene																				
2,4,5-Trichlorophenol																				
2,4,6-Trichlorophenol																				
2,4-Dichlorophenol																				
2,4-Dimethylphenol																				
2,4-Dinitrotoluene																				
2,6-Dinitrotoluene																				
2,4-Dinitrophenol																				
4,6-dinitro-2-methylphenol																				
2-Chloronaphthalene																				
2-Chlorophenol																				
4-Chlorophenyl-phenylether																				
2-Methylnaphthalene																				
2-Methylphenol (o-Cresol)																				
3,3'-Dichlorobenzidine																				
3-Methylphenol/4-Methylphenol (m&p-Cresol)																				
4-Chloroaniline																				
4-Chloro-3-methylphenol																				
2-Nitroaniline																				
3-Nitroaniline																				
4-Nitroaniline																				
4-Nitrophenol																				
2,2'-oxybis(1-chloropropane)																				
Acenaphthene																				
Acetophenone																				
Aniline	R	R	R	R	J	R	J	R	R	R	R									
Anthracene																				
Atrazine																				
Benzaldehyde					UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Benzo(a)anthracene												UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Benzo(a)pyrene	U																			UJ
Benzo(g,h,i)perylene	U	U	U	U								UJ								UJ
Benzo(k)fluoranthene																				UJ
Benzo(k)fluoranthene												UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
bis(2-Chloromethoxy)methane																				
bis(2-chloroisopropyl)ether																				
bis(2-Chloromethyl)ether																				
bis(2-Ethylhexyl)phthalate																				
Butylbenzylphthalate																				
Caprolactam																				
Carbazole																				
Chrysene																				
Dibenzo(a,h)anthracene	U	U	U	U								U								UJ
Dibenzofuran																				
Diethylphthalate																				
Dimethylphthalate																				
Di-n-butylphthalate																				
Di-n-octylphthalate																				UJ
Fluoranthene																				
Fluorene																				
Hexachlorobenzene																				
Hexachlorobutadiene																				
Hexachlorocyclopentadiene																				
Hexachloroethane																				
Indeno(1,2,3-cd)pyrene	U	U	U									U								UJ
Isophorone																				
Naphthalene																				
Nitrobenzene																				
Ethyl parathion																				UJ
N-Nitroso-di-n-propylamine																				
N-Nitrosodiphenylamine																				
Pentachlorophenol																				
Phenanthrene																				
Phenol																				
Pyrene																				

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# CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION DATA QUALIFIER SUMMARY

Flexsys America L.P.  
Nitro, West Virginia

SDG	SNW006										SNW007									
SAMPLE ID	S384863-1	S384863-2	S384863-3	S384863-4	S384909-1	S384909-2	S384909-3	S384909-4	S384909-5	S384909-6	S384958-1	S384958-2	S384958-3	S384958-4	S385103-1	S385103-2	S385103-3	S385103-4	S385103-5	S385103-6
SAMPLE NAME	GW-11A	GW-11B	GW-11C	GW-11CC	GW-6A	GW-6B	GW-6C	GW-14A	GW-14B	GW-14C	GW-9B	GW-9C	GW-16B	GW-16C	GW-2A	GW-2B	GW-2C	GW-5A	GW-5B	GW-5C
COMPOUND (8270, SVOCs)																				
1,1-Biphenyl			R	R			R													
4-Bromophenyl-phenylether			R	R			R													
1,2,4,5-Tetrachlorobenzene			R	R			R													
2,4,5-Trichlorophenol																				
2,4,6-Trichlorophenol																				
2,4-Dichlorophenol																				
2,4-Dimethylphenol																				
2,4-Dinitrotoluene			R	R			R													
2,6-Dinitrotoluene			R	R			R													
2,4-Dinitrophenol																				
4,6-dinitro-2-methylphenol																				
2-Chloronaphthalene			R	R			R													
2-Chlorophenol																				
4-Chlorophenyl-phenylether			R	R			R													
2-Methylnaphthalene			R	R			R													
2-Methylphenol (o-Cresol)																				
3,3'-Dichlorobenzidine			R	R			R													
3-Methylphenol/4-Methylphenol (m&p-Cresol)																				
4-Chloroaniline			J	J			J													
4-Chloro-3-methylphenol																				
2-Nitroaniline			R	R			R													
3-Nitroaniline			R	R			R													
4-Nitroaniline			R	R			R													
4-Nitrophenol																				
2,2'-oxybis(1-chloropropane)			R	R			R													
Acenaphthene			R	R			R													
Acetophenone			R	R			R													
Aniline			J	J			J													
Anthracene			R	R			R													
Atrazine			R	R			R													
Benzaldehyde	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Benzo(a)anthracene			R	R			R													
Benzo(a)pyrene			R	R			R													
Benzo(g,h,i)perylene			R	R			R													
Benzo(k)fluoranthene			R	R			R													
Benzo(k)fluoranthene			R	R			R													
bis(2-Chloroethoxy)methane			R	R			R													
bis(2-chloroisopropyl)ether			R	R			R													
bis(2-Chloroethyl)ether			R	R			R													
bis(2-Ethylhexyl)phthalate			R	R			R													
Butylbenzylphthalate			R	R			R													
Caprolactam			R	R			R													
Carbazole			R	R			R													
Chrysene			R	R			R													
Dibenz(a,h)anthracene			J	J																
Dibenzofuran			R	R			R													
Diethylphthalate			R	R			R													
Dimethylphthalate			R	R			R													
Di-n-butylphthalate			R	R			R													
Di-n-octylphthalate			R	R			R													
Fluoranthene			R	R			R													
Fluorene			R	R			R													
Hexachlorobenzene			R	R			R													
Hexachlorobutadiene			R	R			R													
Hexachlorocyclopentadiene			R	R			R													
Hexachloroethane			R	R			R													
Indeno(1,2,3-cd)pyrene			R	R			R													
Isophorone			R	R			R													
Naphthalene			J	J			J													
Nitrobenzene			R	R			R													
Ethyl parathion	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ										
N-Nitroso-di-n-propylamine			R	R			R													
N-Nitrosodiphenylamine			R	R			R													
Pentachlorophenol																				
Phenanthrene			R	R			R													
Phenol																				
Pyrene			R	R			R													

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# CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION DATA QUALIFIER SUMMARY

Flexsys America L.P.  
Nitro, West Virginia

SDG	SNW07A														SNW009					
SAMPLE ID	S384995-1	S384995-2	S384995-3	S384995-4	S384995-5	S384995-6	S384995-7	S384995-8	S385049-1	S385049-2	S385049-3	S385049-4	S385049-5	S385049-6	S385386-1	S385386-2	S385386-3	S385421-1	S385421-2	S385421-3
SAMPLE NAME	GW-9A	GW-13A	GW-13B	GW-13C	GW-15A	GW-15B	GW-15C	GW-16A	GW-8A	GW-8B	GW-8C	GW-12A	GW-12B	GW-12C	GW-17A	GW-19A	GW-19AA	GW-20A	GW-21A	GW-18A
COMPOUND (8270, SVOCs)																				
1,1-Biphenyl																				
4-Bromophenyl-phenylether																				
1,2,4,5-Tetrachlorobenzene																				
2,4,5-Trichlorophenol																				
2,4,6-Trichlorophenol																				
2,4-Dichlorophenol																				
2,4-Dimethylphenol																				
2,4-Dinitrotoluene																				
2,6-Dinitrotoluene																				
2,4-Dinitrophenol																				
4,6-dinitro-2-methylphenol																				
2-Chloronaphthalene																				
2-Chlorophenol																				
4-Chlorophenyl-phenylether																				
2-Methylnaphthalene																				
2-Methylphenol (o-Cresol)																				
3,3'-Dichlorobenzidine																				
3-Methylphenol/4-Methylphenol (m&p-Cresol)																				
4-Chloroaniline																				
4-Chloro-3-methylphenol																				
2-Nitroaniline																				
3-Nitroaniline	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ												
4-Nitroaniline																				
4-Nitrophenol																				
2,2'-oxybis(1-chloropropane)																				
Acenaphthene																				
Acetophenone																				
Aniline	R	R	R	R	R	R	R	R	R	R	J	R	R	R						
Anthracene																				
Atrazine																				
Benzaldehyde	UJ	UJ	UJ	UJ	UJ	UJ	UJ	J	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Benzo(a)anthracene																				
Benzo(a)pyrene																				
Benzo(g,h,i)perylene																				
Benzo(b)fluoranthene																				
Benzo(k)fluoranthene																				
bis(2-Chloroethoxy)methane																				
bis(2-chloroisopropyl)ether																				
bis(2-Chloroethyl)ether																				
bis(2-Ethylhexyl)phthalate																				
Butylbenzylphthalate																				
Caprolactam																				
Carbazole																				
Chrysene																				
Dibenzo(a,h)anthracene																				
Dibenzofuran																				
Diethylphthalate																				
Dimethylphthalate																				
Di-n-butylphthalate																				
Di-n-octylphthalate																				
Fluoranthene																				
Fluorene																				
Hexachlorobenzene																				
Hexachlorobutadiene																				
Hexachlorocyclopentadiene																				
Hexachloroethane																				
Indeno(1,2,3-cd)pyrene																				
Isophorone																				
Naphthalene																				
Nitrobenzene																				
Ethyl parathion																				
N-Nitroso-di-n-propylamine																				
N-Nitrosodiphenylamine																				
Pentachlorophenol																				
Phenanthrene																				
Phenol																				
Pyrene																				

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# CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION DATA QUALIFIER SUMMARY

Flexsys America L.P.  
Nitro, West Virginia

SDG	SNW010										SNW008									
SAMPLE ID	S385817-1	S385817-2	S385817-3	S385817-4	S385817-5	S385817-6	S385854-1	S385854-2	S385854-3	S385854-4	S385854-5	S385158-1	S385158-2	S385158-3	S385158-4	S385158-5	S385158-6	S385158-7	S385158-8	S385158-9
SAMPLE NAME	GW-19B	GW-19C	GW-20B	GW-20C	GW-21B	GW-21C	GW-17B	GW-18B	GW-18C	GW-17C	GW-EDB	GW-1A	GW-1B	GW-1C	GW-4A	GW-4B	GW-4C	GW-7A	GW-7B	GW-7C
COMPOUND (8270, SVOCs)																				
1,1-Biphenyl		UJ		UJ				UJ			UJ						R			
4-Bromophenyl-phenylether																	R			
1,2,4,5-Tetrachlorobenzene																	R			
2,4,5-Trichlorophenol	UJ					UJ											J			
2,4,6-Trichlorophenol	UJ					UJ											R			
2,4-Dichlorophenol	J					J											J			
2,4-Dimethylphenol	UJ					UJ											R			
2,4-Dinitrotoluene																	R			
2,6-Dinitrotoluene																	R			
2,4-Dinitrophenol	UJ					UJ											R			
4,6-dinitro-2-methylphenol																	R			
2-Chloronaphthalene																	R			
2-Chlorophenol	UJ	UJ				UJ											J			
4-Chlorophenyl-phenylether																	R			
2-Methylnaphthalene																	R			
2-Methylphenol (o-Cresol)	UJ	UJ				UJ											R			
3,3'-Dichlorobenzidine																	R			
3-Methylphenol/4-Methylphenol (m&p-Cresol)	UJ	UJ				UJ											R			
4-Chloroaniline																	R			
4-Chloro-3-methylphenol	UJ					UJ											J			
2-Nitroaniline																	R			
3-Nitroaniline																	R			
4-Nitroaniline																	R			
4-Nitrophenol	J					J											R			
2,2'-oxybis(1-chloropropane)		UJ															R			
Acenaphthene																	R			
Acetophenone		UJ		UJ				UJ			UJ						R			
Aniline																	J			
Anthracene																	R			
Atrazine																	R			
Benzaldehyde	UJ	UJ	UJ		UJ	UJ			UJ	UJ		UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Benzo(a)anthracene																	R			
Benzo(a)pyrene																	R			
Benzo(g,h,i)perylene																	R			
Benzo(b)fluoranthene																	R			
Benzo(k)fluoranthene																	R			
bis(2-Chloroethoxy)methane																	R			
bis(2-chloroisopropyl)ether																	R			
bis(2-Chloroethyl)ether		UJ												UJ			R			
bis(2-Ethylhexyl)phthalate														UJ			R			
Butylbenzylphthalate																	R			
Caprolactam																	R			
Carbazole																	R			
Chrysene																	R			
Dibenzo(a,h)anthracene																	R			
Dibenzofuran																	R			
Diethylphthalate																	R			
Dimethylphthalate																	R			
Di-n-butylphthalate																	R			
Di-n-octylphthalate																	R			
Fluoranthene																	R			
Fluorene																	R			
Hexachlorobenzene																	R			
Hexachlorobutadiene																	R			
Hexachlorocyclopentadiene																	R			
Hexachloroethane		UJ															R			
Indeno(1,2,3-cd)pyrene																	R			
Isophorone																	R			
Naphthalene																	R			
Nitrobenzene																	R			
Ethyl parathion		UJ	UJ	UJ	J			UJ		UJ	UJ	UJ	UJ		UJ	UJ	UJ	UJ	UJ	UJ
N-Nitroso-di-n-propylamine		UJ															R			
N-Nitrosodiphenylamine																	R			
Pentachlorophenol	UJ					UJ											R			
Phenanthrene																	R			
Phenol	UJ	UJ				UJ											R			
Pyrene																	R			

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UJ = Analyte not detected, but quantitation limit estimated.

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**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

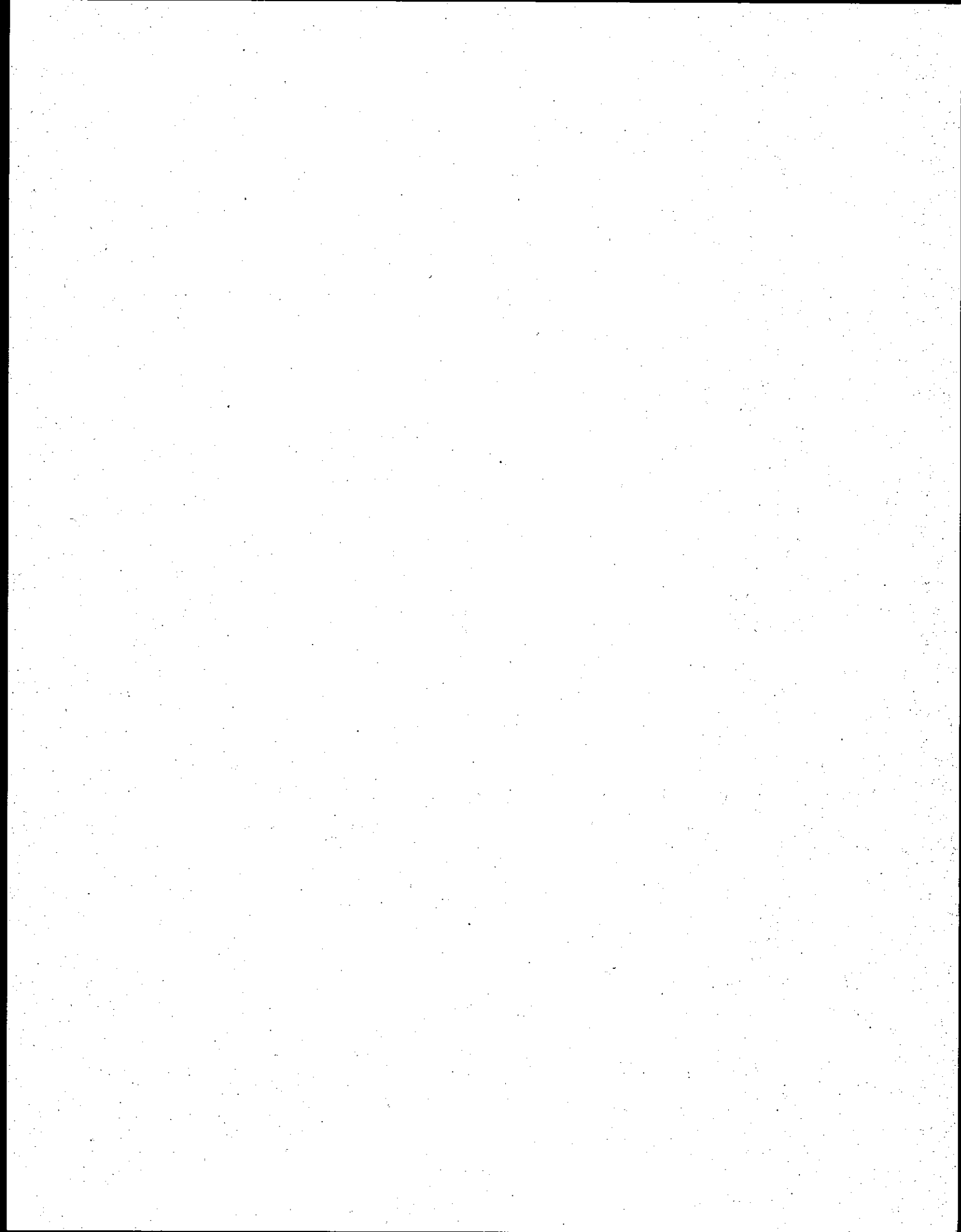
**Flexsys America L.P.  
Nitro, West Virginia**

SDG	SNW001				
SAMPLE ID	S384411-1	S384411-2	S384411-3	S384411-4	S384411-5
SAMPLE NAME	GW-28A	GW-28B	GW-29C	GW-29A	GW-29B
COMPOUND (8270, SVOCs)					
1,1-Biphenyl	UJ	UJ	UJ	UJ	UJ
4-Bromophenyl-phenylether					
1,2,4,5-Tetrachlorobenzene					
2,4,5-Trichlorophenol					
2,4,6-Trichlorophenol					
2,4-Dichlorophenol					
2,4-Dimethylphenol					
2,4-Dinitrotoluene					
2,6-Dinitrotoluene					
2,4-Dinitrophenol					
4,6-dinitro-2-methylphenol					
2-Chloronaphthalene					
2-Chlorophenol					
4-Chlorophenyl-phenylether					
2-Methylnaphthalene					
2-Methylphenol (o-Cresol)					
3,3'-Dichlorobenzidine					
3-Methylphenol/4-Methylphenol (m&p-Cresol)					
4-Chloroaniline					
4-Chloro-3-methylphenol					
2-Nitroaniline					
3-Nitroaniline					
4-Nitroaniline					
4-Nitrophenol					
2,2'-oxybis(1-chloropropane)					
Acenaphthene					
Acetophenone					
Aniline					
Anthracene					
Atrazine					
Benzaldehyde					
Benzo(a)anthracene					
Benzo(a)pyrene					
Benzo(g,h,i)perylene					
Benzo(b)fluoranthene					
Benzo(k)fluoranthene					
bis(2-Chloroethoxy)methane					
bis(2-chloroisopropyl)ether					
bis(2-Chloroethyl)ether					
bis(2-Ethylhexyl)phthalate					
Butylbenzylphthalate					
Caprolactam					
Carbazole					
Chrysene					
Dibenzo(a,h)anthracene					
Dibenzofuran					
Diethylphthalate					
Dimethylphthalate					
Di-n-butylphthalate					
Di-n-octylphthalate					
Fluoranthene					
Fluorene					
Hexachlorobenzene					
Hexachlorobutadiene					
Hexachlorocyclopentadiene					
Hexachloroethane					
Indeno(1,2,3-cd)pyrene					
Isophorone					
Naphthalene					
Nitrobenzene					
Ethyl parathion					
N-Nitroso-di-n-propylamine					
N-Nitrosodiphenylamine					
Pentachlorophenol					
Phenanthrene					
Phenol					
Pyrene					

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UJ = Analyte not detected, but quantitation limit estimated.

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**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	NV004				SNW002									
SAMPLE ID	S384319-1	S384319-2	S384319-3	S384319-4	S384524-1	S384524-2	S384524-3	S384524-4	S384524-5	S384524-6	S384524-7	S384524-8	S384524-9	S384524-10
SAMPLE NAME	GW-25A	GW-25B	GW-25C	GW-26C	GW-32B	GW-32A	GW-32C	GW-31C	GW-31A	GW-30C	GW-30A	GW-33A	GW-30B	GW-33C
COMPOUND (8151, Herbs.)														
2,4,5-T														
2,4,5-TP (Silvex)														
2,4-D	J													
Pentachlorophenol														

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**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW004						SNW003			
SAMPLE ID	S384666-1	S384666-2	S384666-3	S384666-4	S384666-5	S384666-6	S384572-1	S384572-2	S384572-3	S384572-4
SAMPLE NAME	GW-24C	GW-24A	GW-24B	GW-27A	GW-27C	GW-27B	GW-31B	GW-33B	GW-28C	GW-28A
COMPOUND (8151, Herbs.)										
2,4,5-T										
2,4,5-TP (Silvex)										
2,4-D										
Pentachlorophenol										

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**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW005															
SAMPLE ID	S384699-1	S384699-2	S384699-3	S384699-4	S384699-5	S384699-6	S384699-7	S384773-1	S384773-2	S384773-3	S384773-4	S384773-5	S384773-6	S384773-7	S384773-8	S384773-9
SAMPLE NAME	GW-22A	GW-22B	GW-22C	GW-23A	GW-23B	GW-23C	GW-28B	GW-3A	GW-3B	GW-3C	GW-34A	GW-34B	GW-34C	GW-10A	GW-10B	GW-10C
COMPOUND (8151, Herbs.)																
2,4,5-T		J														
2,4,5-TP (Silvex)																
2,4-D																
Pentachlorophenol																

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UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unuseable, presence or absence of analyte cannot be verified.

**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW006									
SAMPLE ID	S384863-1	S384863-2	S384863-3	S384863-4	S384909-1	S384909-2	S384909-3	S384909-4	S384909-5	S384909-6
SAMPLE NAME	GW-11A	GW-11B	GW-11C	GW-11CC	GW-6A	GW-6B	GW-6C	GW-14A	GW-14B	GW-14C
COMPOUND (8151, Herbs.)										
2,4,5-T				J						
2,4,5-TP (Silvex)										
2,4-D					J					
Pentachlorophenol										

U = Analyte not detected.

UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unuseable, presence or absence of analyte cannot be verified.

**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW007									
SAMPLE ID	S384958-1	S384958-2	S384958-3	S384958-4	S385103-1	S385103-2	S385103-3	S385103-4	S385103-5	S385103-6
SAMPLE NAME	GW-9B	GW-9C	GW-16B	GW-16C	GW-2A	GW-2B	GW-2C	GW-5A	GW-5B	GW-5C
COMPOUND (8151, Herbs.)										
2,4,5-T									J	
2,4,5-TP (Silvex)		J							J	
2,4-D										
Pentachlorophenol										

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UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unuseable, presence or absence of analyte cannot be verified.

**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

***Flexsys America L.P.  
Nitro, West Virginia***

SDG	SNW07A													
SAMPLE ID	S384995-1	S384995-2	S384995-3	S384995-4	S384995-5	S384995-6	S384995-7	S384995-8	S385049-1	S385049-2	S385049-3	S385049-4	S385049-5	S385049-6
SAMPLE NAME	GW-9A	GW-13A	GW-13B	GW-13C	GW-15A	GW-15B	GW-15C	GW-16A	GW-8A	GW-8B	GW-8C	GW-12A	GW-12B	GW-12C
COMPOUND (8151, Herbs.)														
2,4,5-T											J			
2,4,5-TP (Silvex)														
2,4-D				J										
Pentachlorophenol														

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**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW009						SNW008								
SAMPLE ID	S385386-1	S385386-2	S385386-3	S385421-1	S385421-2	S385421-3	S385158-1	S385158-2	S385158-3	S385158-4	S385158-5	S385158-6	S385158-7	S385158-8	S385158-9
SAMPLE NAME	GW-17A	GW-19A	GW-19AA	GW-20A	GW-21A	GW-18A	GW-1A	GW-1B	GW-1C	GW-4A	GW-4B	GW-4C	GW-7A	GW-7B	GW-7C
COMPOUND (8151, Herbs.)															
2,4,5-T		J	J									J			
2,4,5-TP (Silvex)	J														
2,4-D		J													
Pentachlorophenol															

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**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

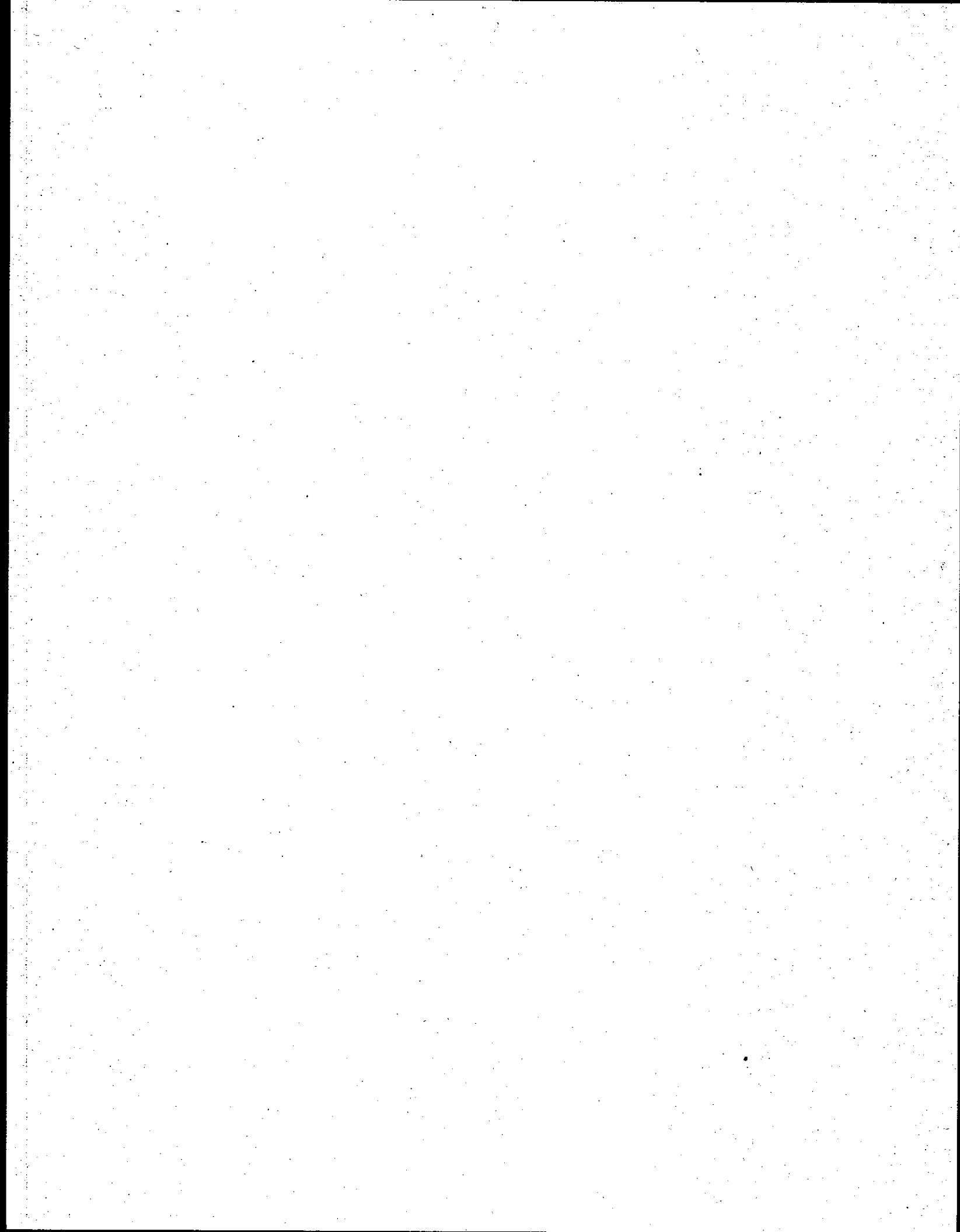
*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW010											SNW001				
SAMPLE ID	S385817-1	S385817-2	S385817-3	S385817-4	S385817-5	S385817-6	S385854-1	S385854-2	S385854-3	S385854-4	S385854-5	S384411-1	S384411-2	S384411-3	S384411-4	S384411-5
SAMPLE NAME	GW-19B	GW-19C	GW-20B	GW-20C	GW-21B	GW-21C	GW-17B	GW-18B	GW-18C	GW-17C	GW-EDB	GW-26A	GW-26B	GW-29C	GW-29A	GW-29B
COMPOUND (8151, Herbs.)																
2,4,5-T	J	J	J	J	J	UJ		UJ	J	J	UJ				J	J
2,4,5-TP (Silvex)					J											
2,4-D																
Pentachlorophenol																

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**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	NV004								SNW009											
SAMPLE ID	S384319-1	S384319-1F	S384319-2	S384319-2F	S384319-3	S384319-3F	S384319-4	S384319-4F	S385386-1	S385386-1F	S385386-2	S385386-2F	S385386-3	S385386-3F	S385421-1	S385421-1F	S385421-2	S385421-2F	S385421-3	S385421-3F
SAMPLE NAME	GW-25A		GW-25B		GW-25C		GW-26C		GW-17A		GW-18A		GW-19AA		GW-20A		GW-21A		GW-18A	
<b>METALS, 6010</b>																				
Aluminum									J	UJ	J	J	J	J	J	UJ	J	UJ	J	UJ
Antimony																				
Arsenic																				
Barium																				
Beryllium																				
Cadmium																				
Calcium																				
Chromium																				
Cobalt																				
Copper																				
Iron																				
Lead																				
Magnesium																				
Manganese																				
Nickel																				
Potassium																				
Selenium																				
Silver																				
Sodium																				
Thallium																				
Vanadium									J	UJ	J	UJ	J	UJ	J	UJ	J	UJ	J	UJ
Zinc										J		J		J		J		J		J
<b>MERCURY, 7470</b>																				
Mercury																				
<b>CYANIDE, 9012A</b>																				
Cyanide																				

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**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW002																			
SAMPLE ID	S384524-1	S384524-1F	S384524-2	S384524-2F	S384524-3	S384524-3F	S384524-4	S384524-4F	S384524-5	S384524-5F	S384524-6	S384524-6F	S384524-7	S384524-7F	S384524-8	S384524-8F	S384524-9	S384524-9F	S384524-10	S384524-10F
SAMPLE NAME	GW-32B		GW-32A		GW-32C		GW-31C		GW-31A		GW-30C		GW-30A		GW-33A		GW-30B		GW-33C	
METALS, 6010																				
Aluminum	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J
Antimony																				
Arsenic																				
Barium																				
Beryllium																				
Cadmium																				
Calcium																				
Chromium																				
Cobalt																				
Copper																				
Iron																				
Lead																				
Magnesium	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J
Manganese	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J
Nickel																				
Potassium																				
Selenium																				
Silver																				
Sodium																				
Thallium																				
Vanadium																				
Zinc																				
MERCURY, 7470																				
Mercury																				
CYANIDE, 9012A																				
Cyanide																				

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**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW003								SNW004											
SAMPLE ID	S384572-1	S384572-1F	S384572-2	S384572-2F	S384572-3	S384572-3F	S384572-4	S384572-4F	S384666-1	S384666-1F	S384666-2	S384666-2F	S384666-3	S384666-3F	S384666-4	S384666-4F	S384666-5	S384666-5F	S384666-6	S384666-6F
SAMPLE NAME	GW-31B		GW-33B		GW-28C		GW-28A		GW-24C		GW-24A		GW-24B		GW-27A		GW-27C		GW-27B	
METALS, 6010																				
Aluminum									J	J	J	J	J	J	J	J	J	J	J	J
Antimony																				
Arsenic																				
Barium																				
Beryllium																				
Cadmium																				
Calcium																				
Chromium																				
Cobalt																				
Copper																				
Iron																				
Lead																				
Magnesium																				
Manganese	J		J		J		J													
Nickel																				
Potassium																				
Selenium																				
Silver																				
Sodium																				
Thallium																				
Vanadium																				
Zinc																				
MERCURY, 7470																				
Mercury																				
CYANIDE, 9012A																				
Cyanide																				

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**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW006																			
SAMPLE ID	S384863-1	S384863-1F	S384863-2	S384863-2F	S384863-3	S384863-3F	S384863-4	S384863-4F	S384909-1	S384909-1F	S384909-2	S384909-2F	S384909-3	S384909-3F	S384909-4	S384909-4F	S384909-5	S384909-5F	S384909-6	S384909-6F
SAMPLE NAME	GW-11A		GW-11B		GW-11C		GW-11CC		GW-6A		GW-6B		GW-6C		GW-14A		GW-14B		GW-14C	
METALS, 6010																				
Aluminum																				
Antimony																				
Arsenic																				
Barium																				
Beryllium																				
Cadmium																				
Calcium																				
Chromium																				
Cobalt																				
Copper																				
Iron																				
Lead																				
Magnesium																				
Manganese																				
Nickel																				
Potassium																				
Selenium																				
Silver																				
Sodium																				
Thallium																				
Vanadium																				
Zinc																				
MERCURY, 7470																				
Mercury																				
CYANIDE, 9012A																				
Cyanide																				

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**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW007																			
SAMPLE ID	S384958-1	S384958-1F	S384958-2	S384958-2F	S384958-3	S384958-3F	S384958-4	S384958-4F	S385103-1	S385103-1F	S385103-2	S385103-2F	S385103-3	S385103-3F	S385103-4	S385103-4F	S385103-5	S385103-5F	S385103-6	S385103-6F
SAMPLE NAME	GW-9B		GW-9C		GW-16B		GW-16C		GW-2A		GW-2B		GW-2C		GW-5A		GW-5B		GW-5C	
METALS, 6010																				
Aluminum	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J
Antimony																				
Arsenic																				
Barium																				
Beryllium																				
Cadmium																				
Calcium																				
Chromium																				
Cobalt																				
Copper																				
Iron																				
Lead																				
Magnesium																				
Manganese																				
Nickel																				
Potassium	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J
Selenium																				
Silver																				
Sodium																				
Thallium																				
Vanadium																				
Zinc	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J
MERCURY, 7470																				
Mercury																				
CYANIDE, 9012A																				
Cyanide																				

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**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW008																	
SAMPLE ID	S385158-1	S385158-1F	S385158-2	S385158-2F	S385158-3	S385158-3F	S385158-4	S385158-4F	S385158-5	S385158-5F	S385158-6	S385158-6F	S385158-7	S385158-7F	S385158-8	S385158-8F	S385158-9	S385158-9F
SAMPLE NAME	GW-1A		GW-1B		GW-1C		GW-4A		GW-4B		GW-4C		GW-7A		GW-7B		GW-7C	
METALS, 6010																		
Aluminum	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J
Antimony																		
Arsenic																		
Barium																		
Beryllium																		
Cadmium																		
Calcium																		
Chromium																		
Cobalt																		
Copper																		
Iron																		
Lead																		
Magnesium																		
Manganese																		
Nickel																		
Potassium	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J
Selenium																		
Silver																		
Sodium																		
Thallium																		
Vanadium																		
Zinc	J		J		J		J		J		J		J		J		J	
MERCURY, 7470																		
Mercury																		
CYANIDE, 9012A																		
Cyanide	UJ		UJ		J		UJ		UJ		UJ		UJ		J		UJ	

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**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW010																					
SAMPLE ID	S385817-1	S385817-1F	S385817-2	S385817-2F	S385817-3	S385817-3F	S385817-4	S385817-4F	S385817-5	S385817-5F	S385817-6	S385817-6F	S385854-1	S385854-1F	S385854-2	S385854-2F	S385854-3	S385854-3F	S385854-4	S385854-4F	S385854-5	S385854-5F
SAMPLE NAME	GW-19B		GW-19C		GW-20B		GW-20C		GW-21B		GW-21C		GW-17B		GW-18B		GW-18C		GW-17C		GW-EDB	
METALS, 6010																						
Aluminum																						
Antimony	J	J	J	UJ	J	J	J	UJ	UJ	UJ	UJ	J	UJ	UJ	UJ	J	UJ	J	UJ	J	UJ	J
Arsenic																						
Barium																						
Beryllium																						
Cadmium																						
Calcium																						
Chromium																						
Cobalt																						
Copper																						
Iron																						
Lead																						
Magnesium																						
Manganese																						
Nickel																						
Potassium																						
Selenium																						
Silver																						
Sodium																						
Thallium																						
Vanadium																						
Zinc																						
MERCURY, 7470																						
Mercury																						
CYANIDE, 9012A																						
Cyanide																						

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**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW001										SNW005											
SAMPLE ID	S384411-1	S384411-1F	S384411-2	S384411-2F	S384411-3	S384411-3F	S384411-4	S384411-4F	S384411-5	S384411-5F	S384699-1	S384699-1F	S384699-2	S384699-2F	S384699-3	S384699-3F	S384699-4	S384699-4F	S384699-5	S384699-5F	S384699-6	S384699-6F
SAMPLE NAME	GW-26A		GW-26B		GW-29C		GW-29A		GW-29B		GW-22A		GW-22B		GW-22C		GW-23A		GW-23B		GW-23C	
METALS, 6010																						
Aluminum	J	UJ	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J
Antimony																						
Arsenic																						
Barium																						
Beryllium																						
Cadmium																						
Calcium																						
Chromium																						
Cobalt																						
Copper																						
Iron																						
Lead																						
Magnesium																						
Manganese																						
Nickel																						
Potassium	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J
Selenium																						
Silver																						
Sodium	J		J		J		J		J													
Thallium																						
Vanadium																						
Zinc											J	J	J	J	J	J	J	J	J	J	J	J
MERCURY, 7470																						
Mercury																						
CYANIDE, 9012A																						
Cyanide																						

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**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW005																			
SAMPLE ID	S384699-7	S384699-7F	S384773-1	S384773-1F	S384773-2	S384773-2F	S384773-3	S384773-3F	S384773-4	S384773-4F	S384773-5	S384773-5F	S384773-6	S384773-6F	S384773-7	S384773-7F	S384773-8	S384773-8F	S384773-9	S384773-9F
SAMPLE NAME	GW-28B		GW-3A		GW-3B		GW-3C		GW-34A		GW-34B		GW-34C		GW-10A		GW-10B		GW-10C	
METALS, 6010																				
Aluminum	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J
Antimony																				
Arsenic																				
Barium																				
Beryllium																				
Cadmium																				
Calcium																				
Chromium																				
Cobalt																				
Copper																				
Iron																				
Lead																				
Magnesium																				
Manganese																				
Nickel																				
Potassium	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J
Selenium																				
Silver																				
Sodium																				
Thallium																				
Vanadium																				
Zinc	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J
MERCURY, 7470																				
Mercury																				
CYANIDE, 9012A																				
Cyanide																				

U = Analyte not detected.

UU = Analyte not detected, but quantitation limit estimated.

R = Data is unusable, presence or absence of analyte cannot be verified.

**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW07A															
SAMPLE ID	S384995-1	S384995-1F	S384995-2	S384995-2F	S384995-3	S384995-3F	S384995-4	S384995-4F	S384995-5	S384995-5F	S384995-6	S384995-6F	S384995-7	S384995-7F	S384995-8	S384995-8F
SAMPLE NAME	GW-9A		GW-13A		GW-13B		GW-13C		GW-15A		GW-15B		GW-15C		GW-16A	
<b>METALS, 6010</b>																
Aluminum	J	J	J	J	J	J	J	J	J	UJ	J	J	J	UJ	J	UJ
Antimony	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	J	J	UJ	UJ
Arsenic																
Barium																
Beryllium																
Cadmium																
Calcium																
Chromium																
Cobalt																
Copper	J	J	J	J	J	J	J	J	J	J	J	J	J	UJ	J	J
Iron																
Lead																
Magnesium																
Manganese																
Nickel																
Potassium																
Selenium																
Silver																
Sodium																
Thallium																
Vanadium																
Zinc	J		J		J		J		J		J		J		J	
<b>MERCURY, 7470</b>																
Mercury																
<b>CYANIDE, 9012A</b>																
Cyanide																

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UJ = Analyte not detected, but quantitation limit estimated.

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**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

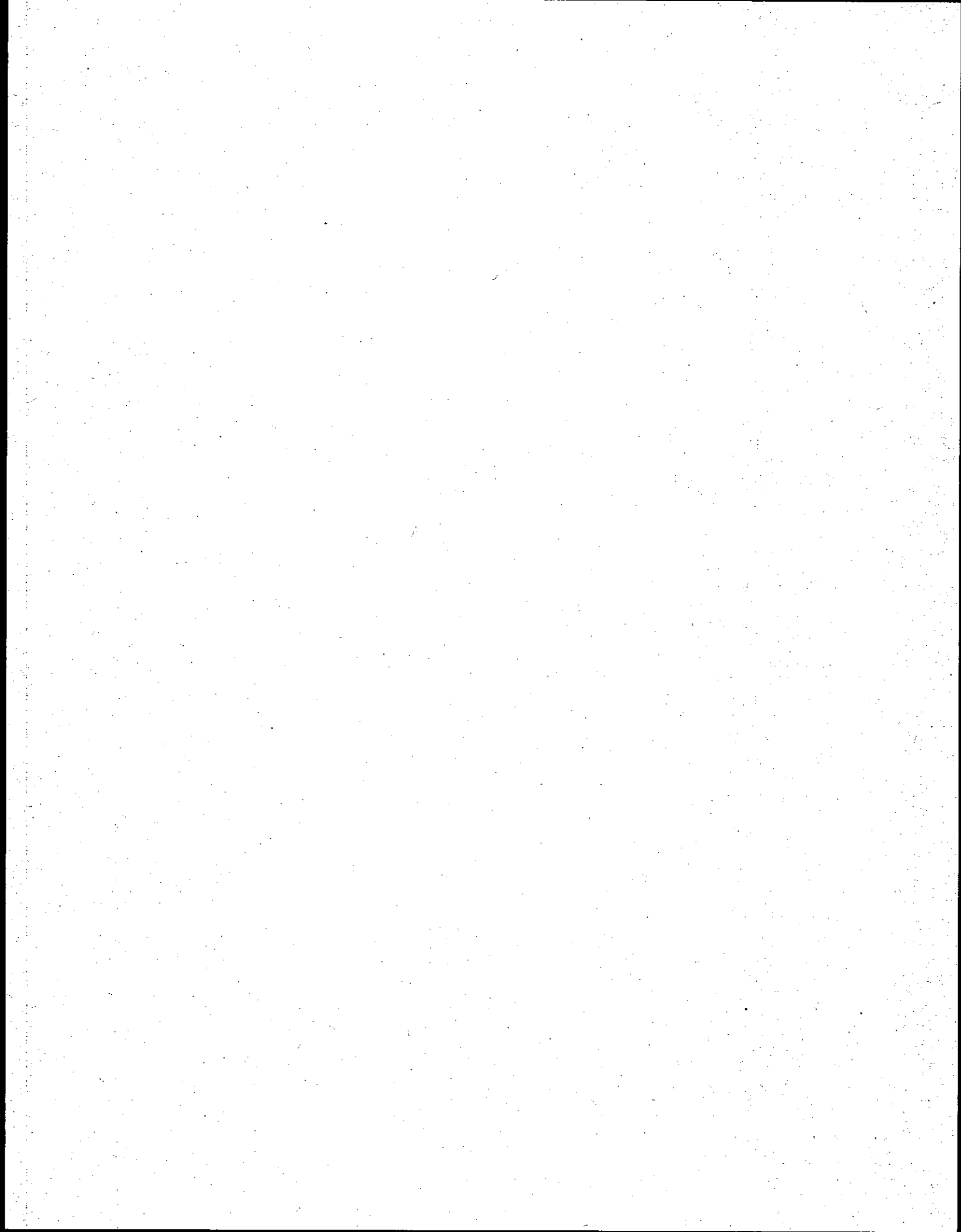
*Flexsys America L.P.  
Nitro, West Virginia*

SDG	SNW07A											
SAMPLE ID	S385049-1	S385049-1F	S385049-2	S385049-2F	S385049-3	S385049-3F	S385049-4	S385049-4F	S385049-5	S385049-5F	S385049-6	S385049-6F
SAMPLE NAME	GW-8A		GW-8B		GW-8C		GW-12A		GW-12B		GW-12C	
<b>METALS, 6010</b>												
Aluminum	J	UJ	J	J	J	J	J	J	J	J	J	UJ
Antimony	UJ	UJ	J	UJ	UJ	J	UJ	UJ	UJ	J	UJ	J
Arsenic												
Barium												
Beryllium												
Cadmium												
Calcium												
Chromium												
Cobalt												
Copper	J	UJ	UJ	UJ	J	UJ	J	J	J	J	J	J
Iron												
Lead												
Magnesium												
Manganese												
Nickel												
Potassium												
Selenium												
Silver												
Sodium												
Thallium												
Vanadium												
Zinc	J		J		J		J		J		J	
<b>MERCURY, 7470</b>												
Mercury												
<b>CYANIDE, 9012A</b>												
Cyanide												

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**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	G3F140168										G3F170175				G3F190280					
SAMPLE ID	-001	-002	-003	-004	-005	-006	-007	-008	-009	-010	-001	-002	-003	-004	-001	-002	-003	-004	-005	-006
SAMPLE NAME	GW-32B	GW-32A	GW-32C	GW-31C	GW-31A	GW-30C	GW-30A	GW-33A	GW-30B	GW-33C	GW-31B	GW-33B	GW-28C	GW-28A	GW-24C	GW-24A	GW-24B	GW-27A	GW-27C	GW-27B
<b>COMPOUND (1613, Dioxins)</b>																				
2,3,7,8-TCDD																				
Total TCDD																				
1,2,3,7,8-PeCDD												U	U	U						
Total PeCDD																				
1,2,3,4,7,8-HxCDD				UJ																
1,2,3,6,7,8-HxCDD																				
1,2,3,7,8,9-HxCDD																				
Total HxCDD																				
1,2,3,4,6,7,8-HpCDD																				
Total HpCDD																				
OCDD																				
2,3,7,8-TCDF																				
Total TCDF																				
1,2,3,7,8-PeCDF																				
2,3,4,7,8-PeCDF																				
Total PeCDF																				
1,2,3,4,7,8-HxCDF																				
1,2,3,6,7,8-HxCDF																				
2,3,4,6,7,8-HxCDF																				
1,2,3,7,8,9-HxCDF																				
Total HxCDF																				
1,2,3,4,6,7,8-HpCDF																				
1,2,3,4,7,8,9-HpCDF																				
Total HpCDF																				
OCDF																				

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**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	G3F200227							G3F230147									G3F250215			
SAMPLE ID	-001	-002	-003	-004	-005	-006	-007	-001	-002	-003	-004	-005	-006	-007	-008	-009	-001	-002	-003	-004
SAMPLE NAME	GW-22A	GW-22B	GW-22C	GW-23A	GW-23B	GW-23C	GW-28B	GW-3A	GW-3B	GW-3C	GW-34A	GW-34B	GW-34C	GW-10A	GW-10B	GW-10C	GW-11A	GW-11B	GW-11C	GW-11CC
COMPOUND (1613, Dioxins)								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
2,3,7,8-TCDD								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
Total TCDD								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
1,2,3,7,8-PeCDD								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
Total PeCDD								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
1,2,3,4,7,8-HxCDD								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
1,2,3,6,7,8-HxCDD								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
1,2,3,7,8,9-HxCDD								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
Total HxCDD								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
1,2,3,4,6,7,8-HpCDD								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
Total HpCDD								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
OCDD								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
2,3,7,8-TCDF								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
Total TCDF								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
1,2,3,7,8-PeCDF								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
2,3,4,7,8-PeCDF								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
Total PeCDF								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
1,2,3,4,7,8-HxCDF								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
1,2,3,6,7,8-HxCDF								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
2,3,4,6,7,8-HxCDF								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
1,2,3,7,8,9-HxCDF								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
Total HxCDF								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
1,2,3,4,6,7,8-HpCDF								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
1,2,3,4,7,8,9-HpCDF								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
Total HpCDF								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				
OCDF								UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ				

U = Analyte not detected.

UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unusable, presence or absence of analyte cannot be verified.

**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	G3F270226						G3F270278				G3F120315					G3G290199				
SAMPLE ID	-001	-002	-003	-004	-005	-006	-001	-002	-003	-004	-001	-002	-003	-004	-005	-001	-002	-003	-004	-005
SAMPLE NAME	GW-6A	GW-6B	GW-6C	GW-14A	GW-14B	GW-14C	GW-9B	GW-9C	GW-16B	GW-16C	GW-26A	GW-26B	GW-29C	GW-29A	GW-29B	GW-17B	GW-18B	GW-18C	GW-17C	GW-EDB
COMPOUND (1613, Dioxins)																				
2,3,7,8-TCDD																				
Total TCDD																				U
1,2,3,7,8-PeCDD																				J
Total PeCDD																				
1,2,3,4,7,8-HxCDD																				
1,2,3,6,7,8-HxCDD																				
1,2,3,7,8,9-HxCDD																				
Total HxCDD																				
1,2,3,4,6,7,8-HpCDD																				
Total HpCDD																				
OCDD																				
2,3,7,8-TCDF																				
Total TCDF																				
1,2,3,7,8-PeCDF																				
2,3,4,7,8-PeCDF																				
Total PeCDF																				
1,2,3,4,7,8-HxCDF																				
1,2,3,6,7,8-HxCDF																				
2,3,4,6,7,8-HxCDF																				
1,2,3,7,8,9-HxCDF																				
Total HxCDF																				
1,2,3,4,6,7,8-HpCDF																				
1,2,3,4,7,8,9-HpCDF																				
Total HpCDF																				
OCDF																				

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UU = Analyte not detected, but quantitation limit estimated.

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**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	G3G020257						G3F280209								G3G010197					
SAMPLE ID	-001	-002	-003	-004	-005	-006	-001	-002	-003	-004	-005	-006	-007	-008	-001	-002	-003	-004	-005	-006
SAMPLE NAME	GW-2A	GW-2B	GW-2C	GW-5A	GW-5B	GW-5C	GW-9A	GW-13A	GW-13B	GW-13C	GW-15A	GW-15B	GW-15C	GW-16A	GW-8A	GW-8B	GW-8C	GW-12A	GW-12B	GW-12C
COMPOUND (1613, Dioxins)																				
2,3,7,8-TCDD																				
Total TCDD																				
1,2,3,7,8-PeCDD																				
Total PeCDD																				
1,2,3,4,7,8-HxCDD																				
1,2,3,6,7,8-HxCDD																				
1,2,3,7,8,9-HxCDD																				
Total HxCDD																				
1,2,3,4,6,7,8-HpCDD																				
Total HpCDD																				
OCDD																				
2,3,7,8-TCDF																				
Total TCDF																				
1,2,3,7,8-PeCDF																				
2,3,4,7,8-PeCDF																				
Total PeCDF																				
1,2,3,4,7,8-HxCDF																				
1,2,3,6,7,8-HxCDF																				
2,3,4,6,7,8-HxCDF																				
1,2,3,7,8,9-HxCDF																				
Total HxCDF																				
1,2,3,4,6,7,8-HpCDF																				
1,2,3,4,7,8,9-HpCDF																				
Total HpCDF																				
OCDF																				

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# CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION DATA QUALIFIER SUMMARY

Flexsys America L.P.  
Nitro, West Virginia

SDG	G3G260180						G3I080131 (Reanalyses)			G3J030185 (Resamples)										
SAMPLE ID	-001	-002	-003	-004	-005	-006	-001	-002	-003	-001	-002	-003	-004	-005	-006	-007	-008	-009	-010	-011
SAMPLE NAME	GW-19B	GW-18C	GW-20B	GW-20C	GW-21B	GW-21C	GW-20B	GW-17B	GW-17C	GW-27C	GW-30A	GW-25C	GW-25A	GW-20A	GW-21B	GW-20B	GW-19C	GW-17A	GW-17C	GW-17B
COMPOUND (1613, Dioxins)																				
2,3,7,8-TCDD																				
Total TCDD																				
1,2,3,7,8-PeCDD																				
Total PeCDD																				
1,2,3,4,7,8-HxCDD																				
1,2,3,6,7,8-HxCDD																				
1,2,3,7,8,9-HxCDD																				
Total HxCDD																				
1,2,3,4,6,7,8-HpCDD																				
Total HpCDD																				
OCDD																				
2,3,7,8-TCDF																				
Total TCDF																				
1,2,3,7,8-PeCDF																				
2,3,4,7,8-PeCDF																				
Total PeCDF																				
1,2,3,4,7,8-HxCDF																				
1,2,3,6,7,8-HxCDF																				
2,3,4,6,7,8-HxCDF																				
1,2,3,7,8,9-HxCDF																				
Total HxCDF																				
1,2,3,4,6,7,8-HpCDF																				
1,2,3,4,7,8,9-HpCDF																				
Total HpCDF																				
OCDF																				

U = Analyte not detected.

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**CA-750 GROUNDWATER CHARACTERIZATION INVESTIGATION  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	G3F100238				G3G030229									G3G120155			G3G160213		
SAMPLE ID	-001	-002	-003	-004	-001	-002	-003	-004	-005	-006	-007	-008	-009	-001	-002	-003	-001	-002	-003
SAMPLE NAME	GW-25A	GW-25B	GW-25C	GW-26C	GW-1A	GW-1B	GW-1C	GW-4A	GW-4B	GW-4C	GW-7A	GW-7B	GW-7C	GW-17A	GW-19A	GW-19AA	GW-20A	GW-21A	GW-16A
<b>COMPOUND (1613, Dioxins)</b>																			
2,3,7,8-TCDD																			
Total TCDD																			
1,2,3,7,8-PeCDD																			
Total PeCDD																			
1,2,3,4,7,8-HxCDD																			
1,2,3,6,7,8-HxCDD																			
1,2,3,7,8,9-HxCDD																			
Total HxCDD																			
1,2,3,4,6,7,8-HpCDD																			
Total HpCDD																			
OCDD																			
2,3,7,8-TCDF																			
Total TCDF																			
1,2,3,7,8-PeCDF																			
2,3,4,7,8-PeCDF																			
Total PeCDF																			
1,2,3,4,7,8-HxCDF																			
1,2,3,6,7,8-HxCDF																			
2,3,4,6,7,8-HxCDF																			
1,2,3,7,8,9-HxCDF																			
Total HxCDF																			
1,2,3,4,6,7,8-HpCDF																			
1,2,3,4,7,8,9-HpCDF																			
Total HpCDF																			
OCDF																			

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## ***APPENDIX C***

## RESULTS OF ANALYTICAL DATA QUALITY EVALUATION

### *Kanawha River Surface Water Samples*

This evaluation was conducted on analytical data generated through VOC/SVOC analysis of surface water samples collected from the Kanawha River directly adjacent to the Solutia facility located in Nitro, West Virginia. The parameters associated with this data set are described in the "Supplemental Surface Water and Sediment Sampling Work Plan" proposed by Solutia Inc. and submitted to the USEPA-Region III and the West Virginia Department of Environmental Protection, Office of Environmental Remediation.

Laboratory sample analysis was conducted by Severn Trent Laboratories – Savannah of Savannah, Georgia for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) by USEPA SW-846 Methods 8260B and 8270C, respectively. N-nitrosodiphenylamine and aniline were added to the 8270C target compound list.

Laboratory data summaries were prepared and received in EPA Level IV QA/QC format. This QA/QC deliverable requirement, along with a 100 percent data validation request, has been completed for this project at the direction of USEPA – Region III. The following narratives serve to provide a summary of the data quality review of the collected surface water samples.

The samples were divided into three sample delivery groups (SDG) and are summarized in the following table.

**Table 1**

SDG	Project No.	Sample Name
NWV01	S248761	BSW-2, ESW-1, ESW-2, ESW-3, FSW-1, FSW-2, FSW-3, FSW-4, FSW-5, GSW-1, GSW-2, GSW-3, GSW-4, GSW-5, GSW-6
NWV02	S248761A	ASW-1, ASW-2, ASW-3, ASW-4, DSW-1, DSW-2, DSW-3, DSW-4, DSW-5
NWV02	S248802A	BG-1
NWV05	S249011	SWBG-2, ER-1

The following table relates sample names to corresponding laboratory sample identifications.

**Table 2**

<b>Laboratory ID</b>	<b>Sample Name</b>	<b>Laboratory ID</b>	<b>Sample Name</b>
248761-1	GSW-6	248761-15	ESW-1
248761-2	GSW-5	248761A-1	ASW-4
248761-3	GSW-4	248761A-2	ASW-3
248761-4	GSW-3	248761A-3	ASW-2
248761-5	GSW-2	248761A-4	ASW-1
248761-6	GSW-1	248761A-5	DSW-4
248761-7	FSW-5	248761A-6	DSW-5
248761-8	FSW-4	248761A-7	DSW-3
248761-9	FSW-3	248761A-8	DSW-2
248761-10	FSW-2	248761A-9	DSW-1
248761-11	FSW-1	248802A-1	BG-1
248761-12	BSW-2	249011A-1	SWBG-2
248761-13	ESW-3	249011A-2	ER-1
248761-14	ESW-2		

The following narratives provide brief summaries of Contract Laboratory Program (CLP) technical requirements, and indicate issues that are outside technical requirements resulting in data qualification. Issues having no impact upon data quality were not addressed.

### **VOLATILE ORGANIC COMPOUNDS**

POTESTA, following the USEPA guidance "*USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*" dated October 1999, completed data validation procedures for the volatile organic compound analyses.

Samples listed by STL-Savannah laboratory identification numbers in Table 2, along with trip blanks and an equipment rinsate blank, were analyzed for VOCs by SW-846 Method 8260B.

### **Holding Times**

Technical holding time requirements state that samples must be acid preserved (pH 2 or less), maintained at 4°C (±2°C), and analyzed within 14 days of sample collection.

### **GC/MS Instrument Performance Checks**

The laboratory performance required instrument performance checks with bromofluorobenzene at the beginning of each 12-hour analytical period on each instrument utilized for sample

analysis. Each performance check met the required ion abundance criteria indicating the instruments were in tune and operating properly.

### **Initial Calibration**

Initial calibration data were reviewed with regard to relative response factors (RRFs), percent relative standard deviation, calibration curve linearity, and standard concentrations.

### **Continuing Calibration**

Continuing calibration (CC) evaluations were based on the following criteria: (1) continuing calibration analysis must be performed at the beginning of each 12-hour analytical period following the analysis of the instrument performance check and prior to the analysis of the method blank; (2) RRFs for each target compound and surrogate must be greater than or equal to 0.05; and (3) % Difference (%D) or % Drift, depending on the type of calibration curve as discussed in SW-846 Method 8000, must be within  $\pm 30\%$  of the initial calibration RRF or initial calibration amount.

NWV01 Non-detect results for carbon tetrachloride in Samples 248761-1 through 248761-15 were qualified "UJ" due to %D exceedance.

### **Blanks**

The laboratory analyzed method blanks and trip blanks as part of the analytical QA/QC for this project work plan. Method blanks are used to identify laboratory, background, and reagent contamination; trip blanks accompany samples from the time of collection to their arrival at the lab and determine if the samples were contaminated during shipment.

Blanks should contain no contamination. If a blank is found to be contaminated with one or more target analytes, then data qualification of the associated samples are determined based on the magnitude of the blank contamination as compared to the concentrations of the particular analytes in the samples. As a rule (5X rule), if the concentration of a particular analyte in a sample is less than 5 times the concentration of that same analyte in an associated blank, then the positive result for that analyte would be qualified as not detected (U). For the common VOC laboratory contaminants (methylene chloride, acetone, 2-butanone, and cyclohexane), positive results would be qualified as not detected if the sample concentration was less than 10 times the concentration found in the blank (10X rule).

The following positive results were qualified "U" due to blank contamination:

NWV01 Benzene in Samples 248761-1 through 248761-5, and 248761-7 through 248761-15.

NWV02 Trichloroethene in Samples 248761A-1, 248761-2, 248761-4, 248761-8 and 248761-9.

## **System Monitoring Compounds**

Three system monitoring compounds (dibromofluoromethane, toluene-d8, and p-bromofluorobenzene) are required to be added to all samples and blanks, and recoveries must be within limits specified in the method.

## **Matrix Spikes/Matrix Spike Duplicates**

Matrix spike/matrix spike duplicate data were evaluated on the basis of the CLP criteria for frequency (1 MS/MSD pair per 20 samples), spike recovery, and relative percent difference between spike and spike duplicate recoveries. MS/MSD criteria were not used solely as a basis for sample data qualification, but were used in conjunction with other criteria in determining data qualification.

## **Laboratory Control Samples**

Laboratory control sample (LCS) data are an indication of analytical accuracy and laboratory performance. A LCS must be analyzed at a frequency of 1 per 20 samples and contain the following compounds within QC limits: vinyl chloride; 1,2-dichloroethane; carbon tetrachloride; 1,2-dichloropropane; trichloroethene; 1,1,2-trichloroethane; benzene; cis-1,3-dichloropropene; bromoform; tetrachloroethene; 1,2-dibromomethane; and 1,4-dichlorobenzene.

## **Internal Standards**

Internal standard (IS) performance is an indication of GC/MS sensitivity and response during sample analyses. Internal standard criteria are two-fold: IS area counts must not vary by more than  $\pm 40$  percent from the associated 12-hour calibration standard; and the retention time of the IS must not vary by more than  $\pm 20$  seconds from the retention time of the associated 12-hour calibration standard.

## **Target Compound Identification**

Criteria for target compound identification minimize the number of erroneous compound identifications, both false positive and false negative, for GC/MS qualitative analysis, and include examination of retention times as compared to standard retention times and sample compound mass spectra, which match standard mass spectra.

## **Compound Quantitation and Reported CRQLs**

Compound quantitation must be calculated according to the correct equation, calculated based on the correct internal standard, based on the quantitation ion specified by the method for internal standards and analytes, and based on the RRF from the appropriate daily standard. CRQL adjustment must be calculated according to the appropriate equation.

## **System Performance**

System performance appears satisfactory over the period in which samples of this analytical group were analyzed. No apparent changes in baseline shift or decrease in sensitivity are noted.

Samples were not analyzed for methyl acetate, cyclohexane, or methyl cyclohexane.

## **SEMIVOLATILE ORGANIC COMPOUNDS**

POTESTA following the USEPA guidance, "*USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*," dated October 1999, completed data validation procedures for the completed semivolatile organic compound analyses.

Samples listed by STL-Savannah laboratory identification numbers in Table 2 were analyzed for SVOCs by SW-846 Method 8270C.

## **Holding Times**

Technical holding time requirements for water matrices state that samples must be maintained at 4°C ( $\pm 2^\circ\text{C}$ ), extracted within 7 days of collection, and analyzed within 40 days of extraction.

## **GC/MS Instrument Performance Checks**

The laboratory performance required instrument performance checks with decafluorotriphenylphosphine at the beginning of each 12-hour analytical period on each instrument utilized for sample analysis. Each performance check met the required ion abundance criteria indicating the instruments were in tune and operating properly.

## **Initial Calibration**

Initial calibration data were reviewed with regard to relative response factors (RRFs), percent relative standard deviation (%RSD), calibration curve linearity, and standard concentrations.

## **Continuing Calibration**

Continuing calibration (CC) evaluations were based on the following criteria: (1) continuing calibration analysis must be performed at the beginning of each 12-hour analytical period following the analysis of the instrument performance check and prior to the analysis of the method blank; (2) RRFs for each target compound and surrogate must be greater than or equal to 0.05; and (3) % Difference (%D) or % Drift, depending on the type of calibration curve as discussed in SW-846 Method 8000, must be within  $\pm 25\%$  of the initial calibration RRF or initial calibration amount.

## Blanks

The laboratory analyzed method blanks as part of the analytical QA/QC for this project work plan in order to identify any laboratory, background, and reagent contamination.

Blanks should contain no contamination. If a blank is found to be contaminated with one or more target analytes, then data qualification of the associated samples are determined based on the magnitude of the blank contamination as compared to the concentrations of the particular analytes in the samples. As a rule (5X rule), if the concentration of a particular analyte in a sample is less than 5 times the concentration of that same analyte in an associated blank, then the positive result for that analyte would be qualified as not detected (U). For the common phthalate contaminants, positive results would be qualified as not detected if the sample concentration was less than 10 times the concentration found in the blank (10X rule).

## Surrogate Spikes

Six system monitoring compounds (surrogate spikes), three acid compounds (2-fluorophenol, phenol-d5, 2,4,6-tribromophenol) and three base/neutral compounds (nitrobenzene-d5, 2-fluorobiphenyl, terphenyl-d14) were added to all samples and blanks.

Base/Neutral Compounds		
Aniline	dibenzofuran	bis(2-ethylhexyl)phthalate
bis(2-chloroethyl)ether	2,4-dinitrotulunene	chrysene
2,2'-oxybis(1-chloropropane)	diethylphthalate	di-n-octylphthalate
n-nitroso-di-n-propylamine	fluorene	benzo(b)fluoranthene
Hexachloroethane	4-chlorophenyl-phenylether	benzo(k)fluoranthene
Nitrobenzene	4-nitroaniline	benzo(a)pyrene
Isophorone	n-nitrosodiphenylamine	indeno(1,2,3-cd)pyrene
bis(2-chloroethoxy)methane	4-bromophenyl-phenylether	dibenzo(a,h)anthracene
Naphthalene	hexachlorobenzene	benzo(g,h,i)perylene
4-chloroaniline	phenanthrene	acetophenone
Hexachlorobutadiene	anthracene	1,2,4,5-tetrachlorobenzene
2-methylnaphthalene	carbazole	1,1-biphenyl
hexachlorocyclopentadiene	di-n-butylphthalate	ethyl parathion
2-chloronaphthalene	Fluoranthene	Benzaldehyde
2-nitroaniline	Pyrene	Caprolactam
Dimethylphthalate	Butylbenzylphthalate	Atrazine
2,6-dinitrotoluene	3,3'-dichlorobenzidine	
Acenaphthene	Benzo(a)anthracene	

Acid Compounds	
Phenol	4-chloro-3-methylphenol
2-chlorophenol	2,4,6-trichlorophenol
o-cresol (2-methylphenol)	2,4,5-trichlorophenol
m&p-cresol (3-methyl/4-methylphenol)	2,4-dinitrophenol
2-nitrophenol	4-nitrophenol
2,4-dimethylphenol	4,6-dinitro-2-methylphenol
2,4-dichlorophenol	pentachlorophenol

### Matrix Spikes/Matrix Spike Duplicates

Matrix spike/matrix spike duplicate data were evaluated on the basis of the CLP criteria for frequency (1 MS/MSD pair per 20 samples), spike recovery, and relative percent difference between spike and spike duplicate recoveries. MS/MSD criteria were not used solely as a basis for sample data qualification, but were used in conjunction with other criteria in determining data qualification.

### Laboratory Control Samples

Laboratory control sample (LCS) data are an indication of analytical accuracy and laboratory performance. A LCS must be analyzed at a frequency of 1 per 20 samples and contain the following compounds within QC limits: phenol; 2-chlorophenol; 4-chloroaniline; 2,4,6-trichlorophenol; bis(2-chloroethyl)ether; n-nitroso-di-n-propylamine; hexachloroethane; isophorone; naphthalene; 2,4-dinitrotoluene; diethylphthalate; n-nitrosodiphenylamine; hexachlorobenzene; and benzo(a)pyrene.

### Internal Standards

Internal standards (IS) performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Internal standard area counts must not vary by more than a factor of two (-50 percent to +100 percent) from the associated 12-hour standard; the retention time of the internal standards must vary by more than  $\pm 30$  seconds from the retention time of the associated 12-hour standard.

### Target Compound Identification

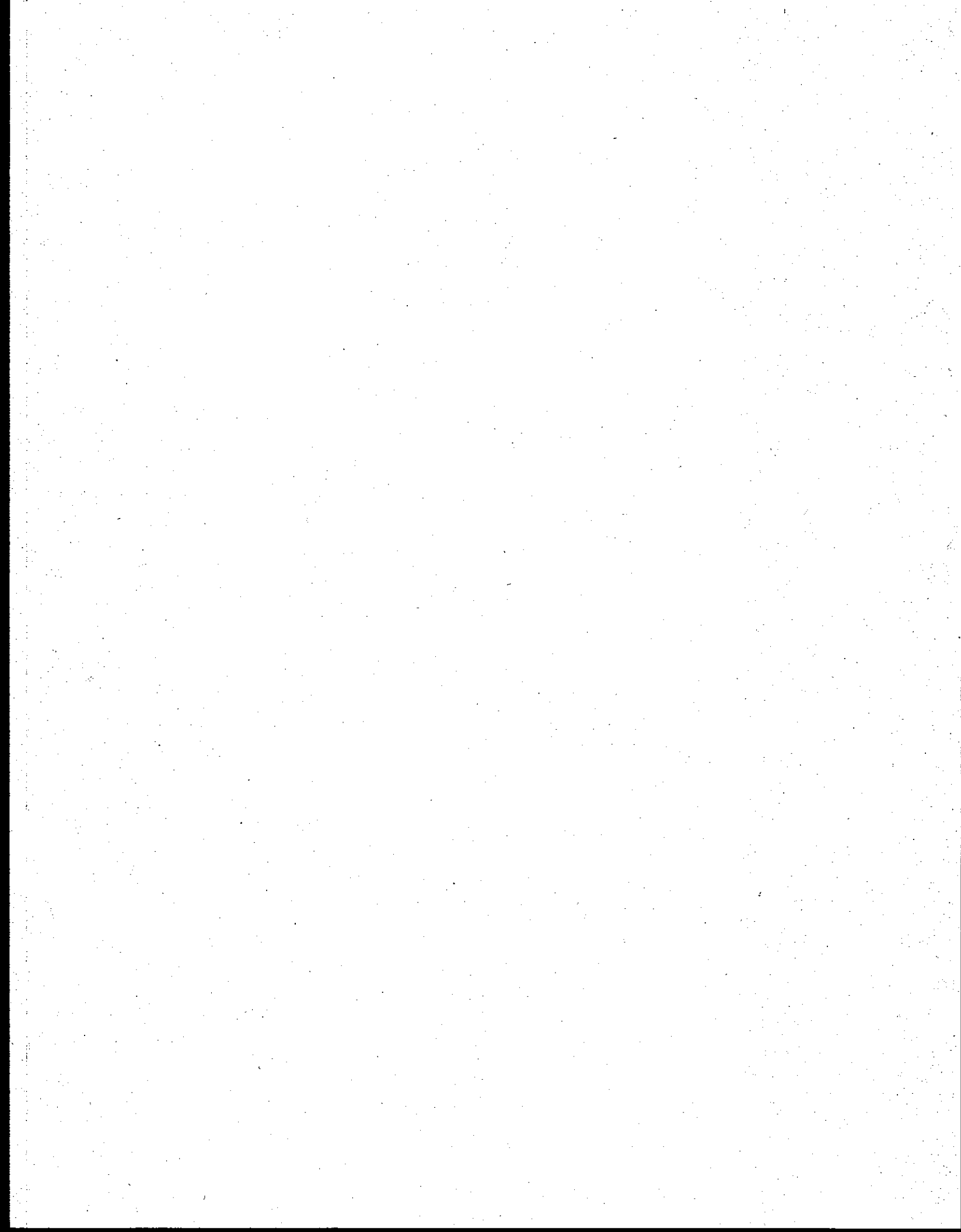
Criteria for target compound identification minimize the number of erroneous compound identifications, both false positive and false negative, for GC/MS qualitative analysis, and include examination of retention times as compared to standard retention times and sample compound mass spectra that match standard mass spectra.

### **Compound Quantitation and Reported CRQLs**

Compound quantitation must be calculated according to the correct equation, calculated based on the correct internal standard, based on the quantitation ion specified by the method for internal standards and analytes, and based on the RRF from the appropriate daily standard. CRQL adjustment must be calculated according to the appropriate equation.

### **System Performance**

System performance appears satisfactory over the period which samples of this analytical group were analyzed. No apparent changes in baseline shift or decrease in sensitivity are noted.



**SURFACE WATER VOC  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	NWV01														
SAMPLE ID	248761-1	248761-2	248761-3	248761-4	248761-5	248761-6	248761-7	248761-8	248761-9	248761-10	248761-11	248761-12	248761-13	248761-14	248761-15
SAMPLE NAME	GSW-6	GSW-5	GSW-4	GSW-3	GSW-2	GSW-1	FSW-5	FSW-4	FSW-3	FSW-2	FSW-1	BSW-2	ESW-3	ESW-2	ESW-1
COMPOUND (8260, VOCs)															
Benzene	U	U	U	U	U		U	U	U	U	U	U	U	U	U
Carbon tetrachloride	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Chlorobenzene															
Chloroform															
cis-1,2-Dichloroethene															
Ethylbenzene															
Toluene															
trans-1,2-Dichloroethene															
trans-1,3-Dichloropropene															
Trichloroethene															
Vinyl chloride															
Xylenes, Total															

U = Analyte not detected.

UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unuseable, presence or absence of analyte cannot be verified.

**SURFACE WATER VOC  
DATA QUALIFIER SUMMARY**

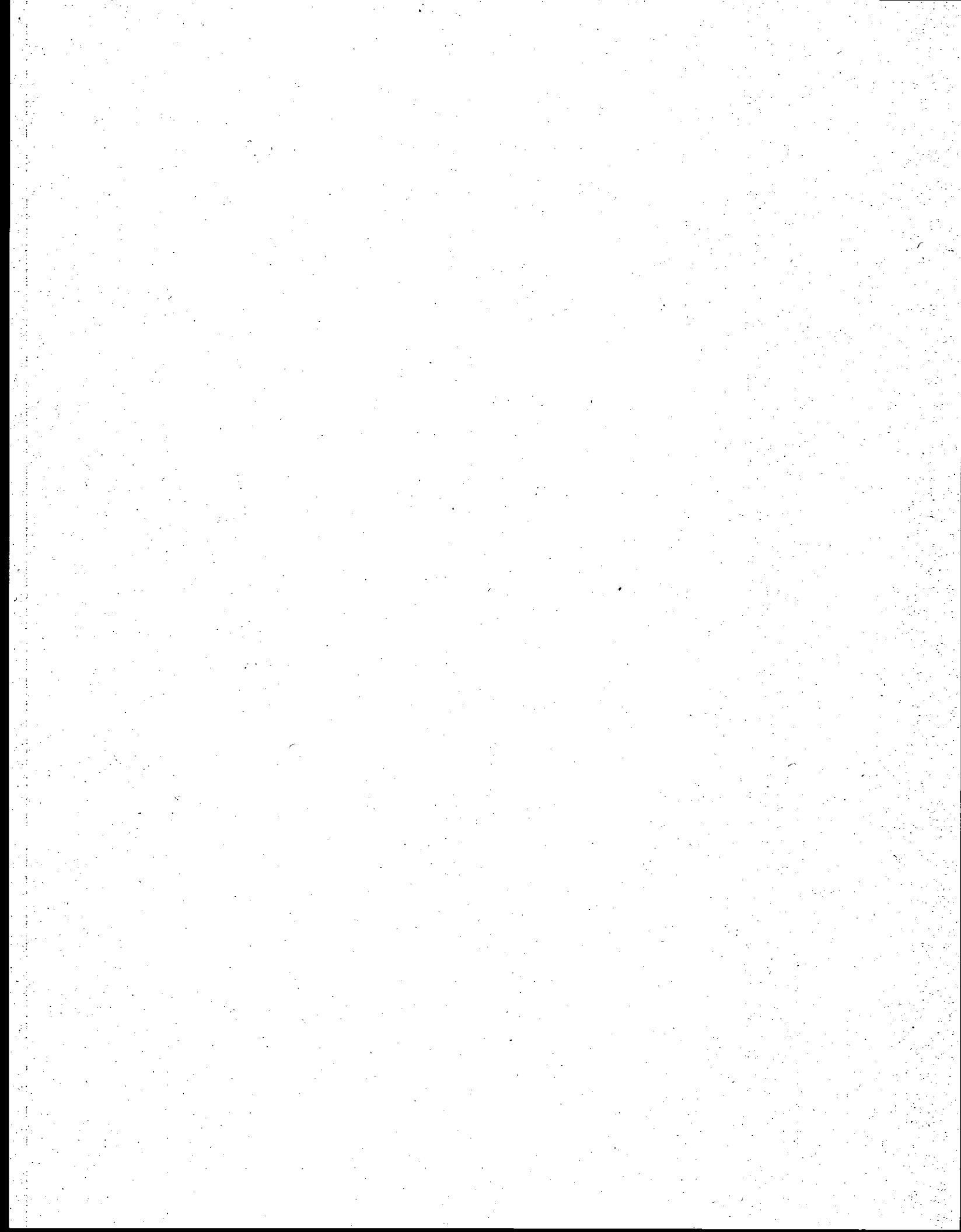
*Flexsys America L.P.  
Nitro, West Virginia*

SDG	NWV02										NWV05	
SAMPLE ID	248761A-1	248761A-2	248761A-3	248761A-4	248761A-5	248761A-6	248761A-7	248761A-8	248761A-9	248761A-10	249011A-1	249011A-2
SAMPLE NAME	ASW-4	ASW-3	ASW-2	ASW-1	DSW-4	DSW-5	DSW-3	DSW-2	DSW-1	BG-1	SWBG-2	ER-1
COMPOUND (8260, VOCs)												
Benzene												
Carbon tetrachloride												
Chlorobenzene												
Chloroform												
cis-1,2-Dichloroethene												
Ethylbenzene												
Toluene												
trans-1,2-Dichloroethene												
trans-1,3-Dichloropropene												
Trichloroethene	U	U		U				U	U			
Vinyl chloride												
Xylenes, Total												

U = Analyte not detected.

UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unuseable, presence or absence of analyte cannot be verified.



**SURFACE WATER SVOC  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	NWW01														
SAMPLE ID	248761-1	248761-2	248761-3	248761-4	248761-5	248761-6	248761-7	248761-8	248761-9	248761-10	248761-11	248761-12	248761-13	248761-14	248761-15
SAMPLE NAME	GSW-6	GSW-5	GSW-4	GSW-3	GSW-2	GSW-1	FSW-5	FSW-4	FSW-3	FSW-2	FSW-1	BSW-2	ESW-3	ESW-2	ESW-1
COMPOUND (8270, SVOCs)															
2,4,5-Trichlorophenol															
2,4,6-Trichlorophenol															
2,4-Dichlorophenol															
2,4-Dimethylphenol															
2-Methylnaphthalene															
2-Methylphenol (o-Cresol)															
3-Methylphenol/4-Methylphenol (m&p-Cresol)															
4-Chloro-3-methylphenol															
4-Nitrophenol															
Aniline															
Naphthalene															
N-Nitrosodiphenylamine															
Phenol															

U = Analyte not detected.

UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unuseable, presence or absence of analyte cannot be verified.

**SURFACE WATER SVOC  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	NWW02										NWW05	
SAMPLE ID	248761A-1	248761A-2	248761A-3	248761A-4	248761A-5	248761A-6	248761A-7	248761A-8	248761A-9	248761A-10	249011A-1	249011A-2
SAMPLE NAME	ASW-4	ASW-3	ASW-2	ASW-1	DSW-4	DSW-5	DSW-3	DSW-2	DSW-1	BG-1	SWBG-2	ER-1
COMPOUND (8270, SVOCs)												
2,4,5-Trichlorophenol												
2,4,6-Trichlorophenol												
2,4-Dichlorophenol												
2,4-Dimethylphenol												
2-Methylnaphthalene												
2-Methylphenol (o-Cresol)												
3-Methylphenol/4-Methylphenol (m&p-Cresol)												
4-Chloro-3-methylphenol												
4-Nitrophenol												
Aniline												
Naphthalene												
N-Nitrosodiphenylamine												
Phenol												

U = Analyte not detected.

UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unuseable, presence or absence of analyte cannot be verified.

## ***APPENDIX D***

## RESULTS OF ANALYTICAL DATA QUALITY EVALUATION

### *Kanawha River Sediment Samples*

This evaluation was conducted on analytical data generated through VOC/SVOC and dioxin/furan analysis of sediment samples collected from the Kanawha River directly adjacent to the Solutia facility located in Nitro, West Virginia. The parameters associated with this data set are described in the "*Supplemental Surface Water and Sediment Sampling Work Plan*" proposed by Solutia Inc. and submitted to the USEPA-Region III and the West Virginia Department of Environmental Protection, Office of Environmental Remediation.

Severn Trent Laboratories of Savannah, Georgia analyzed samples for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). Severn Trent Laboratories of Sacramento, California analyzed samples for polychlorinated dibenzo-p-dioxins (dioxins) and polychlorinated dibenzofurans (furans).

Laboratory data summaries were prepared and received in EPA Level IV QA/QC format. This QA/QC deliverable requirement, along with a 100 percent data validation request, has been completed for this project at the direction of USEPA – Region III. The following narratives serve to provide a summary of the data quality review of the collected sediment samples.

The samples were divided into three sample delivery groups (SDG) and are summarized in the following table.

**Table 1**

<b>Savannah SDG</b>	<b>Savannah Project #</b>	<b>Sacramento Project #</b>	<b>Sample Names</b>
NWV03	S248802	G2L170302	GSD-2, GSD-3, GSD-4, GSD-5, GSD-6
NWV04	S249011	G2L170302	DSD-1, DSD-2, DSD-3, DSD-4, DSD-5, ESD-1, ESD-2, ESD-3, FSD-1, FSD-2, FSD-3, FSD-4, FSD-5, GSD-1
NWV06	S249063	G2L170302	SDBG-1, SDBG-2
NA	NA	G2L170302	ASD-2, ASD-7, ASD-10, BSD-3, CSD-2, CSD-7, CSD-9

The following table relates sample names to corresponding laboratory sample identifications.

**Table 2**

Sample Name	Savannah Sample ID	Sacramento Sample ID	Sample Name	Savannah Sample ID	Sacramento Sample ID
GSD-6	248802-1	G2L170302-001	FSD-3	249011-10	G2L170302-012
GSD-5	248802-2	G2L170302-002	FSD-2	249011-11	G2L170302-013
GSD-4	248802-3	G2L170302-003	FSD-1	249011-12	G2L170302-014
GSD-3	248802-4	G2L170302-004	ESD-3	249011-13	G2L170302-016
GSD-2	248802-5	G2L170302-005	ESD-2	249011-14	G2L170302-017
ESD-1	249011-1	G2L170302-018	SDBG-2	249063-1	G2L170302-027
DSD-5	249011-2	G2L170302-022	SDBG-1	249063-2	G2L170302-028
DSD-4	249011-3	G2L170302-023	ASD-2	NA	G2L170302-021
DSD-3	249011-4	G2L170302-024	ASD-7	NA	G2L170302-020
DSD-2	249011-5	G2L170302-025	ASD-10	NA	G2L170302-019
DSD-1	249011-6	G2L170302-026	BSD-3	NA	G2L170302-015
GSD-1	249011-7	G2L170302-008	CSD-2	NA	G2L170302-009
FSD-5	249011-8	G2L170302-010	CSD-7	NA	G2L170302-007
FSD-4	249011-9	G2L170302-011	CSD-9	NA	G2L170302-006

The following narratives provide brief summaries of Contract Laboratory Program (CLP) technical requirements, and indicate issues which are outside technical requirements resulting in data qualification. Issues having no impact upon data quality were not addressed.

### **VOLATILE ORGANIC COMPOUNDS**

POTESTA, following the USEPA guidance "*USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*" dated October 1999, completed data validation procedures for the volatile organic compound analyses.

Samples listed by STL-Savannah laboratory identification numbers in Table 2, along with trip blanks and an equipment rinsate blank, were analyzed for VOCs by SW-846 Method 8260B.

### **Holding Times**

Technical holding time requirements state that samples must be acid preserved (pH 2 or less), maintained at 4°C (±2°C), and analyzed within 14 days of sample collection.

### **GC/MS Instrument Performance Checks**

The laboratory performance required instrument performance checks with bromofluorobenzene at the beginning of each 12-hour analytical period on each instrument utilized for sample analysis. Each performance check met the required ion abundance criteria indicating the instruments were in tune and operating properly.

## Initial Calibration

Initial calibration data were reviewed with regard to relative response factors (RRFs), percent relative standard deviation, calibration curve linearity, and standard concentrations.

## Continuing Calibration

Continuing calibration (CC) evaluations were based on the following criteria: (1) continuing calibration analysis must be performed at the beginning of each 12-hour analytical period following the analysis of the instrument performance check and prior to the analysis of the method blank; (2) RRFs for each target compound and surrogate must be greater than or equal to 0.05; and (3) % Difference (%D) or % Drift, depending on the type of calibration curve as discussed in SW-846 Method 8000, must be within  $\pm 30\%$  of the initial calibration RRF or initial calibration amount.

NWV04 Non-detect results for trans-1,2-dichloroethene in samples 249011-6, 249011-7, and 249011-8 were qualified "UJ" due to %D exceedance.

## Blanks

The laboratory analyzed method blanks and trip blanks as part of the analytical QA/QC for this project work plan. Method blanks are used to identify laboratory, background, and reagent contamination; trip blanks accompany samples from the time of collection to their arrival at the lab and determine if the samples were contaminated during shipment.

Blanks should contain no contamination. If a blank is found to be contaminated with one or more target analytes, then data qualification of the associated samples are determined based on the magnitude of the blank contamination as compared to the concentrations of the particular analytes in the samples. As a rule (5X rule), if the concentration of a particular analyte in a sample is less than 5 times the concentration of that same analyte in an associated blank, then the positive result for that analyte would be qualified as not detected (U). For the common VOC laboratory contaminants (methylene chloride, acetone, 2-butanone, and cyclohexane), positive results would be qualified as not detected if the sample concentration was less than 10 times the concentration found in the blank (10X rule).

## System Monitoring Compounds

Three system monitoring compounds (dibromofluoromethane, toluene-d8, and p-bromofluorobenzene) are required to be added to all samples and blanks, and recoveries must be within limits specified in the method.

NWV04 Positive results for vinyl chloride, cis-1,2-dichloroethene, benzene, and chlorobenzene in 249011-3 and chlorobenzene, cis-1,2-dichloroethene, total xylenes, and trichloroethene in 249011-6 were qualified "J".

## **Matrix Spikes/Matrix Spike Duplicates**

Matrix spike/matrix spike duplicate data were evaluated on the basis of the CLP criteria for frequency (1 MS/MSD pair per 20 samples), spike recovery, and relative percent difference between spike and spike duplicate recoveries. MS/MSD criteria were not used solely as a basis for sample data qualification, but were used in conjunction with other criteria in determining data qualification.

NWV04 Sample 249011-3 was designated MS/MSD for this SDG. Upon review of MS/MSD results, it was noted that neither the MS nor the MSD exhibit a reportable quantity of vinyl chloride, while the sample analysis of 249011-3 indicated a concentration of 70 ug/kg for vinyl chloride. It was also noted that Sample S249011-3 was analyzed sequent to the analysis of S249011-14 which contained a high level of vinyl chloride (740 ug/kg). It was concluded that the 70 ug/kg result for vinyl chloride in S249011-3 was due to carry-over from the S249011-14 analysis, and was consequently qualified "U".

## **Laboratory Control Samples**

Laboratory control sample (LCS) data are an indication of analytical accuracy and laboratory performance. A LCS must be analyzed at a frequency of 1 per 20 samples and contain the following compounds within QC limits: vinyl chloride; 1,2-dichloroethane; carbon tetrachloride; 1,2-dichloropropane; trichloroethene; 1,1,2-trichloroethane; benzene; cis-1,3-dichloropropene; bromoform; tetrachloroethene; 1,2-dibromomethane; and 1,4-dichlorobenzene.

## **Internal Standards**

Internal standard (IS) performance is an indication of GC/MS sensitivity and response during sample analyses. Internal standard criteria are two-fold: IS area counts must not vary by more than  $\pm 40$  percent from the associated 12-hour calibration standard; and the retention time of the IS must not vary by more than  $\pm 20$  seconds from the retention time of the associated 12-hour calibration standard.

NWV03 All compounds quantitated using chlorobenzene-d5 in 48802-3 (toluene, chlorobenzene, ethyl benzene, total xylene) are qualified "UJ".

## **Target Compound Identification**

Criteria for target compound identification minimize the number of erroneous compound identifications, both false positive and false negative, for GC/MS qualitative analysis, and include examination of retention times as compared to standard retention times and sample compound mass spectra which match standard mass spectra.

## **Compound Quantitation and Reported CRQLs**

Compound quantitation must be calculated according to the correct equation, calculated based on the correct internal standard, based on the quantitation ion specified by the method for internal standards and analytes, and based on the RRF from the appropriate daily standard. CRQL adjustment must be calculated according to the appropriate equation.

## **System Performance**

System performance appears satisfactory over the period which samples of this analytical group were analyzed. No apparent changes in baseline shift or decrease in sensitivity are noted.

Samples were not analyzed for methyl acetate, cyclohexane, or methyl cyclohexane.

## **SEMIVOLATILE ORGANIC COMPOUNDS**

POTESTA, following the USEPA guidance "*USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*" dated October 1999, completed data validation procedures for the completed semivolatile organic compound analyses.

Samples listed by STL-Savannah laboratory identification numbers in Table 2 were analyzed for SVOCs by SW-846 Method 8270C.

## **Holding Times**

Technical holding time requirements for water matrices state that samples must be maintained at 4°C ( $\pm 2^\circ\text{C}$ ), extracted within 7 days of collection, and analyzed within 40 days of extraction.

## **GC/MS Instrument Performance Checks**

The laboratory performance required instrument performance checks with decafluorotriphenylphosphine at the beginning of each 12-hour analytical period on each instrument utilized for sample analysis. Each performance check met the required ion abundance criteria indicating the instruments were in tune and operating properly.

## **Initial Calibration**

Initial calibration data were reviewed with regard to relative response factors (RRFs), percent relative standard deviation (%RSD), calibration curve linearity, and standard concentrations.

## **Continuing Calibration**

Continuing calibration (CC) evaluations were based on the following criteria: (1) continuing calibration analysis must be performed at the beginning of each 12-hour analytical period following the analysis of the instrument performance check and prior to the analysis of the

method blank; (2) RRFs for each target compound and surrogate must be greater than or equal to 0.05; and (3) % Difference (%D) or % Drift, depending on the type of calibration curve as discussed in SW-846 Method 8000, must be within  $\pm 25\%$  of the initial calibration RRF or initial calibration amount.

## Blanks

The laboratory analyzed method blanks as part of the analytical QA/QC for this project work plan in order to identify any laboratory, background, and reagent contamination.

Blanks should contain no contamination. If a blank is found to be contaminated with one or more target analytes, then data qualification of the associated samples are determined based on the magnitude of the blank contamination as compared to the concentrations of the particular analytes in the samples. As a rule (5X rule), if the concentration of a particular analyte in a sample is less than 5 times the concentration of that same analyte in an associated blank, then the positive result for that analyte would be qualified as not detected (U). For the common phthalate contaminants, positive results would be qualified as not detected if the sample concentration was less than 10 times the concentration found in the blank (10X rule).

## Surrogate Spikes

Six system monitoring compounds (surrogate spikes), three acid compounds (2-fluorophenol, phenol-d5, 2,4,6-tribromophenol), and three base/neutral compounds (nitrobenzene-d5, 2-fluorobiphenyl, terphenyl-d14) were added to all samples and blanks.

Base/Neutral Compounds		
Aniline	dibenzofuran	bis(2-ethylhexyl)phthalate
bis(2-chloroethyl)ether	2,4-dinitrotolunene	chrysene
2,2'-oxybis(1-chloropropane)	diethylphthalate	di-n-octylphthalate
n-nitroso-di-n-propylamine	fluorene	benzo(b)fluoranthene
Hexachloroethane	4-chlorophenyl-phenylether	benzo(k)fluoranthene
Nitrobenzene	4-nitroaniline	benzo(a)pyrene
Isophorone	n-nitrosodiphenylamine	indeno(1,2,3-cd)pyrene
bis(2-chloroethoxy)methane	4-bromophenyl-phenylether	dibenzo(a,h)anthracene
Naphthalene	hexachlorobenzene	benzo(g,h,i)perylene
4-chloroaniline	phenanthrene	acetophenone
Hexachlorobutadiene	anthracene	1,2,4,5-tetrachlorobenzene
2-methylnaphthalene	carbazole	1,1-biphenyl
hexachlorocyclopentadiene	di-n-butylphthalate	ethyl parathion
2-chloronaphthalene	Fluoranthene	Benzaldehyde
2-nitroaniline	Pyrene	Caprolactam
Dimethylphthalate	Butylbenzylphthalate	Atrazine
2,6-dinitrotoluene	3,3'-dichlorobenzidine	
Acenaphthene	Benzo(a)anthracene	

Acid Compounds	
Phenol	4-chloro-3-methylphenol
2-chlorophenol	2,4,6-trichlorophenol
o-cresol (2-methylphenol)	2,4,5-trichlorophenol
m&p-cresol (3-methyl/4-methylphenol)	2,4-dinitrophenol
2-nitrophenol	4-nitrophenol
2,4-dimethylphenol	4,6-dinitro-2-methylphenol
2,4-dichlorophenol	pentachlorophenol

### Matrix Spikes/Matrix Spike Duplicates

Matrix spike/matrix spike duplicate data were evaluated on the basis of the CLP criteria for frequency (1 MS/MSD pair per 20 samples), spike recovery, and relative percent difference between spike and spike duplicate recoveries. MS/MSD criteria were not used solely as a basis for sample data qualification, but were used in conjunction with other criteria in determining data qualification.

### Laboratory Control Samples

Laboratory control sample (LCS) data are an indication of analytical accuracy and laboratory performance. A LCS must be analyzed at a frequency of 1 per 20 samples and contain the following compounds within QC limits: phenol, 2-chlorophenol, 4-chloroaniline, 2,4,6-trichlorophenol, bis(2-chloroethyl)ether, n-nitroso-di-n-propylamine, hexachloroethane, isophorone, naphthalene, 2,4-dinitrotoluene, diethylphthalate, n-nitrosodiphenylamine, hexachlorobenzene, and benzo(a)pyrene.

### Internal Standards

Internal standards (IS) performance criteria ensure that GC/MS sensitivity and response are stable during every analytical run. Internal standard area counts must not vary by more than a factor of two (-50 percent to +100 percent) from the associated 12-hour standard; the retention time of the internal standards must vary by more than  $\pm 30$  seconds from the retention time of the associated 12-hour standard.

### Target Compound Identification

Criteria for target compound identification minimize the number of erroneous compound identifications, both false positive and false negative, for GC/MS qualitative analysis, and include examination of retention times as compared to standard retention times and sample compound mass spectra which match standard mass spectra.

## **Compound Quantitation and Reported CRQLs**

Compound quantitation must be calculated according to the correct equation, calculated based on the correct internal standard, based on the quantitation ion specified by the method for internal standards and analytes, and based on the RRF from the appropriate daily standard. CRQL adjustment must be calculated according to the appropriate equation.

## **System Performance**

System performance appears satisfactory over the period which samples of this analytical group were analyzed. No apparent changes in baseline shift or decrease in sensitivity are noted.

## **DIOXIN/FURAN ANALYSIS**

For evaluation of data for this project, POTEITA utilized *"USEPA Contract Laboratory Program National Functional Guidelines for Chlorinated Dioxin/Furan Data Review,"* EPA-540-R-02-003, August 2002.

Samples listed by STL-Sacramento laboratory identification numbers in Table 2 were analyzed for polychlorinated dibenzo-p-dioxins (dioxins) and polychlorinated dibenzofurans (furans) by EPA Method 1613B. Samples G2L170302-027 and G2L170302-028 were analyzed by EPA Method 8280A due to high petroleum content.

## **Holding Times**

According to 1613B, water samples must be stored at 4°C ( $\pm 2^\circ\text{C}$ ) in the dark from the time of sample collection until extraction. In the presence of residual chlorine, 80 mg of sodium thiosulfate per liter of sample must be added. If the sample pH is  $>9$ , the sample pH must be adjusted to pH 7-9 with sulfuric acid. Samples may be stored for up to 1 year before extraction and extracts may also be stored for up to 1 year. According to 8280A, samples must be extracted within 30 days of collection and analyzed within 45 days of extraction.

## **Mass Calibration and Mass Spectrometer Resolution**

Verification must be provided that instruments utilized in sample analyses have met the minimum resolution requirements of  $\geq 10,000$  for perfluorokerosene at the beginning of the 12-hour analytical period.

## **Window Defining Mix**

A window defining mix must be analyzed during each 12-hour analytical period on instruments equipped with a DB-5 column demonstrating appropriate switching times for selected ion monitoring time descriptors.

## **Chromatographic Resolution**

Satisfactory chromatographic resolution must be demonstrated by the analysis of a column performance solution during each 12-hour analytical period. Instrument set up with DB-5 columns should demonstrate peak separations between the 2, 3, 7, 8 - TCDD and 1, 2, 3, 8 - TCDD with a valley less than 25% of the peak height of 2, 3, 7, 8 - TCDD.

## **Instrument Stability**

Midpoint (C3) standards must be analyzed at the beginning of the 12-hour analytical period with regard to retention times, relative retention times, ion abundance ratios, signal-to-noise ratios, and response.

## **Initial Calibration**

Initial calibration of instruments utilized for sample analyses must meet the minimum criteria set forth by the USEPA regarding resolution, ion abundance, retention time, sensitivity, linearity, concentration, and frequency.

## **Calibration Verification**

Calibration verification must be performed at the beginning of the 12-hour analytical period on each instrument utilized for sample analyses with regard to retention times, relative retention times, ion abundance ratios, signal-to-noise ratios, and response of a midpoint (C3) standard.

## **Identification Criteria**

Identified compounds must meet the following criteria: (1) retention times and ion current responses for the quantitation ions must maximize within 2 seconds, (2) the signal-to-noise ratio for each native analyte ion must be at least 2.5 times the background noise, and (3) ion abundance ratio criteria for native and labeled analytes must be met.

Data for the following analytes were qualified "R" due to exceedance of ion abundance ratio criteria: 1,2,3,4,6,7,8-HpCDF (Samples -001, -003 through -006, -008, -009, -011, -012, -016, -017, -019, -020, and -024 through -026) and 1,2,3,7,8-PeCDF (Samples -019 and -026).

## **Method Blanks**

Method blanks should not contain any interference above the contract required quantitation limit at the m/z of the specified.

## **Laboratory Control Samples**

The laboratory must prepare and analyze an LCS for each SDG, and all spiked compounds must be within QC limits.

### **Labeled Compound Recoveries**

Recovery of the labeled compounds is an indication of laboratory's and method's effectiveness in extracting compounds of interest. All samples should meet criteria for recovery, signal/noise ratio, and ion abundance ratio of labeled compounds.

Data for 2, 3, 7, 8 – TCDD in Sample -026 and OCDD and isomers of HpCDF in Sample -027 were qualified "J" due to ion abundance and recovery issues.



**SEDIMENT VOC  
DATA QUALIFIER SUMMARY**

***Flexsys America L.P.  
Nitro, West Virginia***

SDG	NWV03					NWV06	
SAMPLE ID	248802-1	248802-2	248802-3	248802-4	248802-5	249063-1	249063-2
SAMPLE NAME	GSD-6	GSD-5	GSD-4	GSD-3	GSD-2	SDBG-2	SDBG-1
COMPOUND (8260, VOCs)							
Benzene							
Carbon tetrachloride							
Chlorobenzene			UJ				
Chloroform							
cis-1,2-Dichloroethene							
Ethylbenzene			UJ				
Toluene			UJ				
trans-1,2-Dichloroethene							
trans-1,3-Dichloropropene							
Trichloroethene							
Vinyl chloride							
Xylenes, Total			UJ				

U = Analyte not detected.

UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unuseable, presence or absence of analyte cannot be verified.

**SEDIMENT VOC  
DATA QUALIFIER SUMMARY**

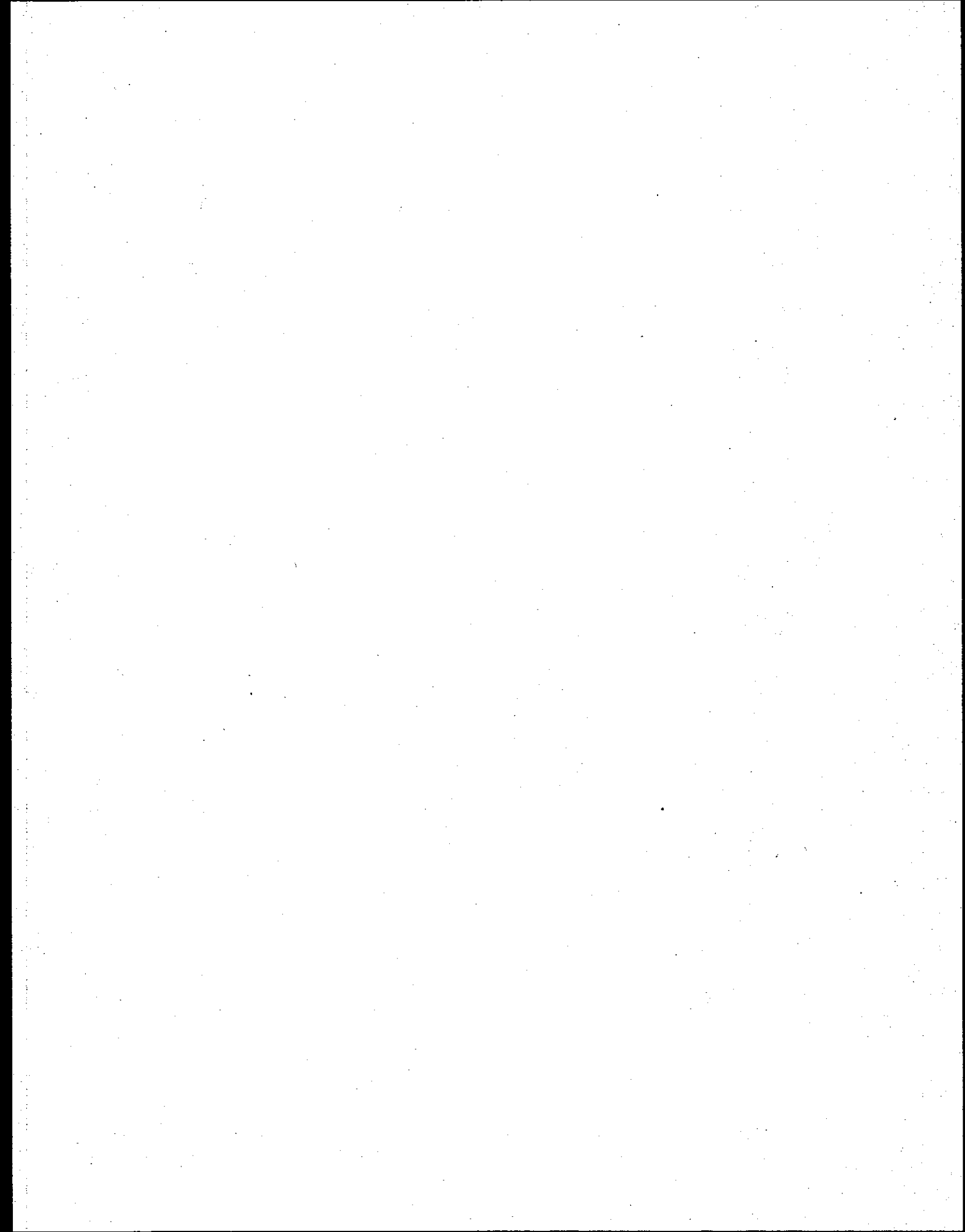
*Flexsys America L.P.  
Nitro, West Virginia*

SDG	NWV04													
SAMPLE ID	249011-1	249011-2	249011-3	249011-4	249011-5	249011-6	249011-7	249011-8	249011-9	249011-10	249011-11	249011-12	249011-13	249011-14
SAMPLE NAME	ESD-1	DSD-5	DSD-4	DSD-3	DSD-2	DSD-1	GSD-1	FSD-5	FSD-4	FSD-3	FSD-2	FSD-1	ESD-3	ESD-2
COMPOUND (8260, VOCs)														
Benzene			J											
Carbon tetrachloride														
Chlorobenzene			J			J								
Chloroform														
cis-1,2-Dichloroethene			J			J								
Ethylbenzene														
Toluene														
trans-1,2-Dichloroethene						UJ	UJ	UJ						
trans-1,3-Dichloropropene														
Trichloroethene						J								
Vinyl chloride			U											
Xylenes, Total						J								

U = Analyte not detected.

UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unuseable, presence or absence of analyte cannot be verified.



**SEDIMENT SVOC  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

SDG	NWV03					NWV06	
SAMPLE ID	248802-1	248802-2	248802-3	248802-4	248802-5	249063-1	249063-2
SAMPLE NAME	GSD-6	GSD-5	GSD-4	GSD-3	GSD-2	SDBG-2	SDBG-1
COMPOUND (8270, SVOCs)							
2,4,5-Trichlorophenol							
2,4,6-Trichlorophenol							
2,4-Dichlorophenol							
2,4-Dimethylphenol							
2-Methylnaphthalene							
2-Methylphenol (o-Cresol)							
3-Methylphenol/4-Methylphenol (m&p-Cresol)							
4-Chloro-3-methylphenol							
4-Nitrophenol							
Aniline							
Naphthalene							
N-Nitrosodiphenylamine							
Phenol							

U = Analyte not detected.

UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unuseable, presence or absence of analyte cannot be verified.

**SEDIMENT SVOC  
DATA QUALIFIER SUMMARY**

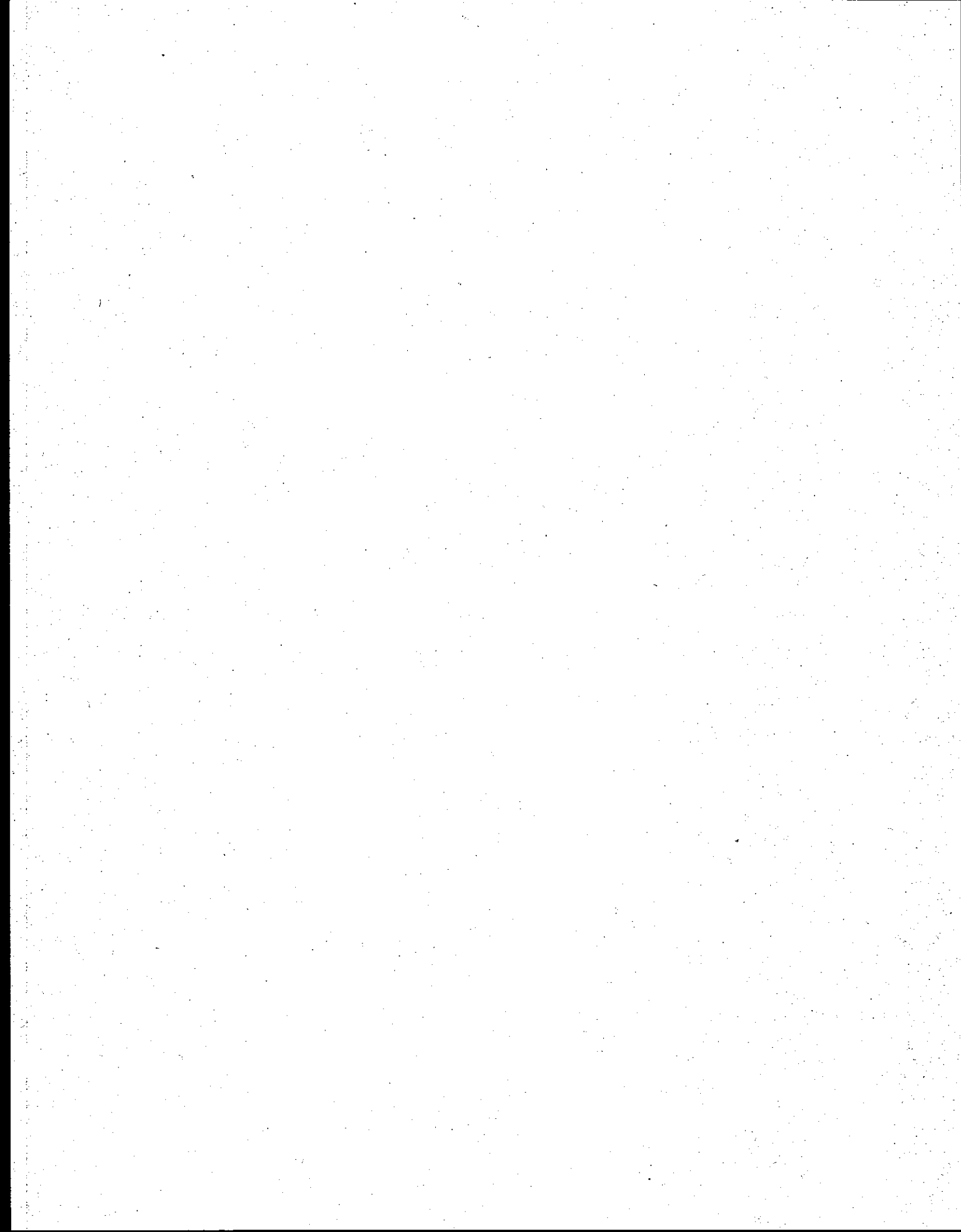
*Flexsys America L.P.  
Nitro, West Virginia*

SDG	NWV04													
SAMPLE ID	249011-1	249011-2	249011-3	249011-4	249011-5	249011-6	249011-7	249011-8	249011-9	249011-10	249011-11	249011-12	249011-13	249011-14
SAMPLE NAME	ESD-1	DSD-5	DSD-4	DSD-3	DSD-2	DSD-1	GSD-1	FSD-5	FSD-4	FSD-3	FSD-2	FSD-1	ESD-3	ESD-2
COMPOUND (8270, SVOCs)														
2,4,5-Trichlorophenol														
2,4,6-Trichlorophenol														
2,4-Dichlorophenol														
2,4-Dimethylphenol														
2-Methylnaphthalene														
2-Methylphenol (o-Cresol)														
3-Methylphenol/4-Methylphenol (m&p-Cresol)														
4-Chloro-3-methylphenol														
4-Nitrophenol														
Aniline														
Naphthalene														
N-Nitrosodiphenylamine														
Phenol														

U = Analyte not detected.

UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unuseable, presence or absence of analyte cannot be verified.



# **SEDIMENT DIOXINS/FURANS DATA QUALIFIER SUMMARY**

***Flexsys America L.P.  
Nitro, West Virginia***

Sample No. Sample Name	G2L170302-001 GSD-6	G2L170302-002 GSD-5	G2L170302-003 GSD-4	G2L170302-004 GSD-3	G2L170302-005 GSD-2	G2L170302-006 CSD-9	G2L170302-007 CSD-7	G2L170302-008 GSD-1	G2L170302-009 CSD-2	G2L170302-010 FSD-5
COMPOUND (1613, Dioxins)										
2,3,7,8-TCDD										
Total TCDD										
1,2,3,7,8-PeCDD										
Total PeCDD										
1,2,3,4,7,8-HxCDD										
1,2,3,6,7,8-HxCDD										
1,2,3,7,8,9-HxCDD										
Total HxCDD										
1,2,3,4,6,7,8-HpCDD										
Total HpCDD										
OCDD										
2,3,7,8-TCDF										
Total TCDF										
1,2,3,7,8-PeCDF										
2,3,4,7,8-PeCDF										
Total PeCDF										
1,2,3,4,7,8-HxCDF										
1,2,3,6,7,8-HxCDF										
2,3,4,6,7,8-HxCDF										
1,2,3,7,8,9-HxCDF										
Total HxCDF										
1,2,3,4,6,7,8-HpCDF	R		R			R		R	R	
1,2,3,4,7,8,9-HpCDF										
Total HpCDF										
OCDF										

U = Analyte not detected.

UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unuseable, presence or absence of analyte cannot be verified.

# **SEDIMENT DIOXINS/FURANS DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

Sample No. Sample Name	G2L170302-011 FSD-4	G2L170302-012 FSD-3	G2L170302-013 FSD-2	G2L170302-014 FSD-1	G2L170302-015 BSD-3	G2L170302-016 ESD-3	G2L170302-017 ESD-2	G2L170302-018 ESD-1	G2L170302-019 ASD-10	G2L170302-020 ASD-7
COMPOUND (1613, Dioxins)										
2,3,7,8-TCDD										
Total TCDD										
1,2,3,7,8-PeCDD										
Total PeCDD										
1,2,3,4,7,8-HxCDD										
1,2,3,6,7,8-HxCDD										
1,2,3,7,8,9-HxCDD										
Total HxCDD										
1,2,3,4,6,7,8-HpCDD										
Total HpCDD										
OCDD										
2,3,7,8-TCDF										
Total TCDF										
1,2,3,7,8-PeCDF									R	
2,3,4,7,8-PeCDF										
Total PeCDF										
1,2,3,4,7,8-HxCDF										
1,2,3,6,7,8-HxCDF										
2,3,4,6,7,8-HxCDF										
1,2,3,7,8,9-HxCDF										
Total HxCDF										
1,2,3,4,6,7,8-HpCDF	R	R				R	R		R	R
1,2,3,4,7,8,9-HpCDF										
Total HpCDF										
OCDF										

U = Analyte not detected.

UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unuseable, presence or absence of analyte cannot be verified.

**SEDIMENT DIOXINS/FURANS  
DATA QUALIFIER SUMMARY**

*Flexsys America L.P.  
Nitro, West Virginia*

Sample No. Sample Name	G2L170302-021 ASD-2	G2L170302-022 DSD-5	G2L170302-023 DSD-4	G2L170302-024 DSD-3	G2L170302-025 DSD-2	G2L170302-026 DSD-1	G2L170302-027 SDBG-2	G2L170302-028 SDBG-1
<b>COMPOUND (1613, Dioxins)</b>								
2,3,7,8-TCDD						J		
Total TCDD								
1,2,3,7,8-PeCDD								
Total PeCDD								
1,2,3,4,7,8-HxCDD								
1,2,3,6,7,8-HxCDD								
1,2,3,7,8,9-HxCDD								
Total HxCDD								
1,2,3,4,6,7,8-HpCDD								
Total HpCDD								
OCDD							J	
2,3,7,8-TCDF								
Total TCDF								
1,2,3,7,8-PeCDF						R		
2,3,4,7,8-PeCDF								
Total PeCDF								
1,2,3,4,7,8-HxCDF								
1,2,3,6,7,8-HxCDF								
2,3,4,6,7,8-HxCDF								
1,2,3,7,8,9-HxCDF								
Total HxCDF								
1,2,3,4,6,7,8-HpCDF				R	R	R	J	
1,2,3,4,7,8,9-HpCDF							J	
Total HpCDF							J	
OCDF								

U = Analyte not detected.

UJ = Analyte not detected, but quantitation limit estimated.

R = Data is unuseable, presence or absence of analyte cannot be verified.

## ***APPENDIX E***

**TABLE 1****Summary of Invalid Data for GW-4C, GW-6C, and GW-11C**

Sample Type	Analyte	Analyte Type	Samples
Groundwater	1,1-Biphenyl	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	4-Bromophenyl-phenylether	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	1,2,4,5-Tetrachlorobenzene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	2,4,6-Trichlorophenyl	SVOC	GW-4C
Groundwater	2,4-Dimethylphenol	SVOC	GW-4C
Groundwater	2,4-Dinitrotoluene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	2,6-Dinitrotoluene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	2,4-Dinitrophenol	SVOC	GW-4C
Groundwater	4,6-Dinitro-2-methylphenol	SVOC	GW-4C
Groundwater	2-Chloronaphthalene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	4-Chlorophenyl-phenylether	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	2-Methylnaphthalene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	o-Cresol	SVOC	GW-4C
Groundwater	3,3-Dichlorobenzidine	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	m&p-Cresol		GW-4C
Groundwater	4-Chloro-3-methylphenol		GW-4C
Groundwater	2-Nitroaniline	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	3-Nitroaniline	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	4-Nitroaniline	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	4-Nitrophenol		GW-4C
Groundwater	2,2-oxybis-(1-chloropropane)	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Acenaphthene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Acetophenone	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Anthracene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Atrazine	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Benzo(a)anthracene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Benzo(a)pyrene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Benzo(g,h,i)perylene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Benzo(b)fluoranthene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Benzo(k)fluoranthene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	bis(2-Chloroethoxy)methane	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	bis(2-chloroisopropyl)ether	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	bis(2-Chloroethyl)ether	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	bis(2-Ethylhexyl)phthalate	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Butylbenzylphthalate	SVOC	GW-11C, GW-6C, GW-4C

Sample Type	Analyte	Analyte Type	Samples
Groundwater	Caprolactam	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Carbazole	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Chrysene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Dibenzo(a,h)anthracene	SVOC	GW-4C
Groundwater	Dibenzofuran	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Diethylphthalate	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Dimethylphthalate	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Di-n-butylphthalate	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Di-n-octylphthalate	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Fluoranthene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Fluorene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Hexachlorobenzene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Hexachlorobutadiene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Hexachlorocyclopentadiene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Hexachloroethane	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Indeno(1,2,3-cd)pyrene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Isophorone	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Naphthalene	SVOC	GW-4C
Groundwater	Nitrobenzene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	N-Nitroso-di-n-propylamine	SVOC	GW-11C, CC, GW-6C, GW-4C
Groundwater	N-Nitrosodiphenylamine	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Pentachlorophenol	SVOC	GW-4C
Groundwater	Phenanthrene	SVOC	GW-11C, GW-6C, GW-4C
Groundwater	Phenol	SVOC	GW-4C
Groundwater	Pyrene	SVOC	GW-11C, GW-6C, GW-4C